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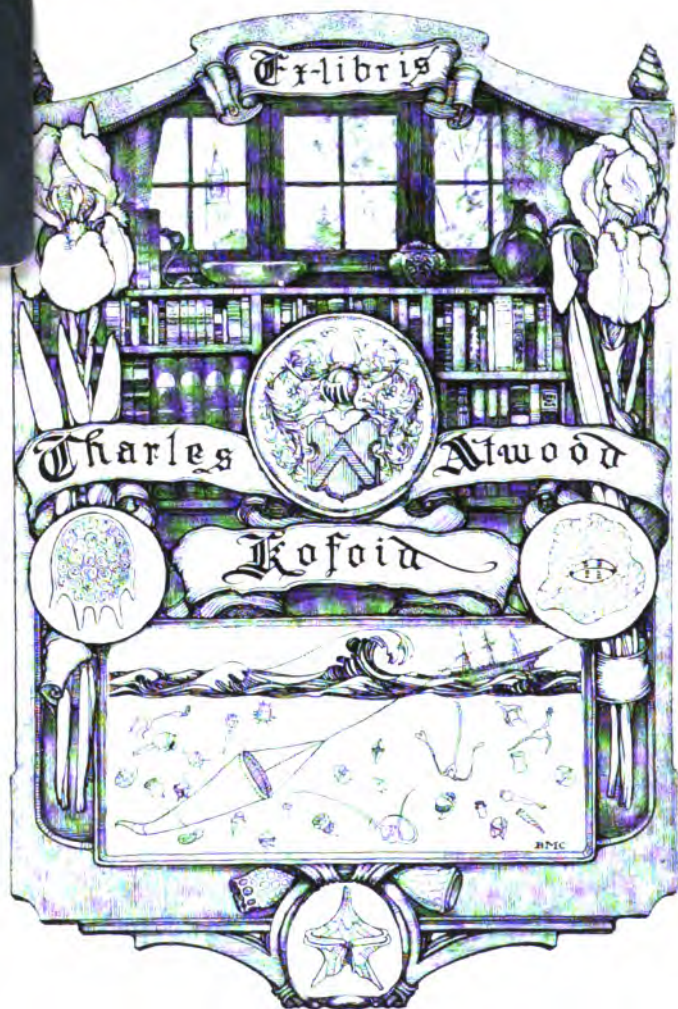
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HANDBOOKS OF
PRACTICAL GARDENING

THE BOOK OF
THE IRIS

BY

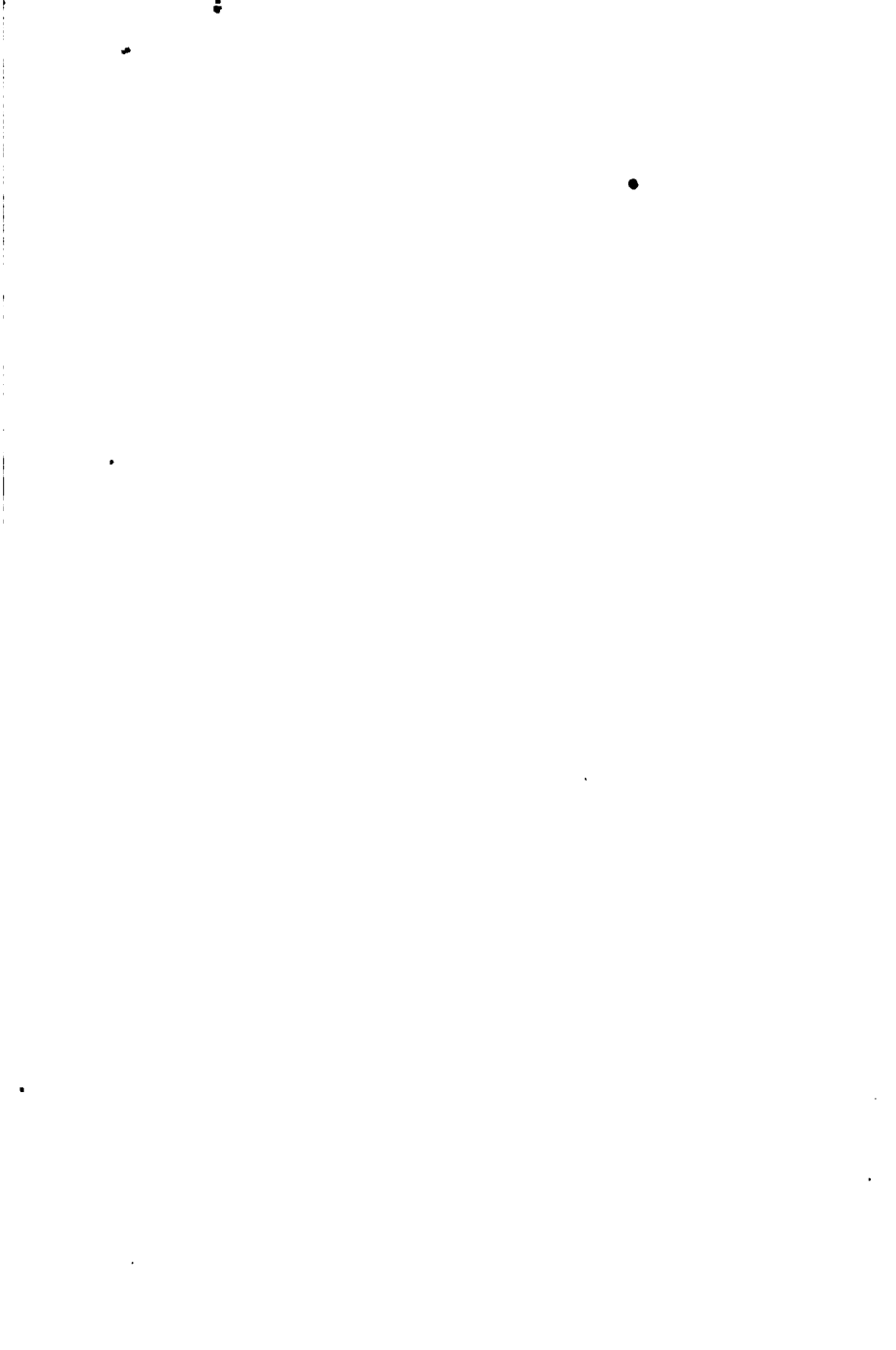
R. IRWIN LYNCH





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HANDBOOKS OF PRACTICAL GARDENING—XXI
EDITED BY HARRY ROBERTS

THE BOOK OF THE IRIS







SPANISH IRISES

THE BOOK OF THE IRIS

BY

R. IRWIN LYNCH

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WITH A CHAPTER ON THE CULTIVATION
OF THE ONCOCYCLUS SECTION ESPECI-
ALLY WRITTEN FOR THIS WORK BY
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ISLE OF WIGHT

JOHN LANE : THE BODLEY HEAD
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TO
PROFESSOR SIR MICHAEL FOSTER,
K.C.B., M.P., SEC. R.S., D.C.L., V.M.H.,
&c., &c.

THIS WORK IS RESPECTFULLY DEDICATED.

To him we owe the introduction and knowledge of many of the most beautiful species of Irises which now adorn our gardens. To him also we are indebted for many garden productions, the no less beautiful hybrids which have resulted from his skill in artificial crossing. We desire to recognise the value of his long-continued leadership in the cultivation and collection of Irises—to which so much of their present popularity is due—and we have also to express our appreciation of the great scientific value of his work in botanical description and in hybridising. Especially must this opportunity be taken of acknowledging the liberality with which his unique knowledge is always placed at the service of others.

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PREFACE

THIS work has been written with two principal aims in view. I have endeavoured, in the first place, to give all the useful information upon culture that is available, and, secondly, to provide an easy and efficient means for the verification of names and for the naming of plants. In the verification of names that happen to be correct there should be no difficulty, but with regard to the naming of plants, it must be remembered that Irises are exceedingly variable. They hybridise both in the garden and in a wild state, and intermediates, or forms not agreeing precisely with any description, are at least liable to be met with. I still hope, however, that naming will be effected in most cases without difficulty. By dividing into small, easily understood groups, and by the construction of keys, I have hoped to provide a special facility.

The plants included in this work are chiefly those which are believed to be in cultivation or which may at any time be introduced or re-introduced. All references are not given, but chiefly those which are likely to be useful. Fellows of the Royal Horticultural Society may often find the figures and books they require in the Lindley Library¹ which, after June 1904, will be found in the New Hall in Vincent Square. Descriptions, whenever possible, are from the plants themselves, but I have to express my great indebtedness to Mr Baker's botanically indispensable *Handbook of the Irideae*, from

¹ This I mention by kind permission of the Secretary, who characteristically observes, "We desire to be useful."

which I have freely drawn all the information I required, and also to his series of articles in the *Gardeners' Chronicle* of 1876. In the bulbous sections I am very largely indebted to Sir Michael Foster's valuable work on that division of the genus, published by the Royal Horticultural Society, and throughout the genus, for his species, I have usually referred to his original descriptions. Synonyms I have given only when it seemed desirable, a large number serving no purpose in a book of this description. It will be found that I have sometimes disregarded botanical affinity in my arrangement, for the sake of easy reference, but for this I may, no doubt, be forgiven. For specimens, kindly sent me at different times, I have especially to thank Messrs P. Barr & Sons, Mrs Ewbank, Mr Amos Perry, Messrs Wallace & Co., and Mr C. G. Van Tubergen, jun. I have to thank Mr E. Allard, my foreman of the Indoor Department, for almost all the photographs herein reproduced. All newer Irises up to the end of 1903 I have included or referred to. I may here remark that a number of the more recent novelties require to be brought to the notice of some competent authority, when in flower, for proper determination and description. I should be glad to hear from any reader on points of interest or importance.

"All faults I make, when I shall come to know them
I do repent."—*Winter's Tale*, iii. 2.

R. IRWIN LYNCH.

BOTANIC GARDEN,
CAMBRIDGE,
Dec. 31st, 1903.

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* From photographs by E. Allard.

† From blocks kindly lent by Mr C. G. van Tubergen, Junr., of Haarlem.

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* From photographs by E. Allard.

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THE BOOK OF THE IRIS



THE BOOK OF THE IRIS

PART I

CHAPTER I

STRUCTURE AND NATURAL HISTORY OF THE IRIS FLOWER

ALL plants of the natural order *Iridaceae* have the ovary below the perianth of the flower; they have seeds which, in addition to the germ, contain a horny food substance known as endosperm, and they have three stamens with extrorse anthers. These features alone serve to distinguish an Irid from all other monocotyledons,¹ but in an Iris we must also find that the style branches are opposite the stamens and the outer segments of the perianth, that the style branches are furnished with crests and have transverse stigmas, that the perianth (almost always) has a tube above the ovary, and that the stamens are not joined together. And further we may notice that Irises are native only of the North Temperate Zone—head-quarters being found probably in Central Asia.

Let us examine the flower of an Iris in greater detail. On cutting across the ovary we find that it has three cells and that the ovules are attached in the inner angle of each cell (except only in *Iris tuberosa*, which has

¹ Plants which have one cotyledon, floral whorls in threes, leaves with parallel veins, etc.—one of the two great classes of flowering plants.

no cell divisions). Above the ovary is a tube, but this is sometimes so short that it must be regarded as obsolete. There are six perianth segments; the three outer, known as the "falls," are usually reflexed and have often a very characteristic feature in the possession of a beard, but this may be absent, or, in its place, there may be a crest. The three inner segments differ in form from the outer segments and are known as the "standards"; they have usually neither beard nor crest, are usually erect, and have always a stalk. The stamens are inserted at the base of the falls, the anthers are attached by their bases, and, as already observed, they are extrorse, *i.e.* they are turned outwards. This is somewhat unusual, but here there is a particular meaning in the fact, which we shall presently notice. They are situated below and sheltered by the arch of the style-arm. There are three style-arms bearing each a lip-like, transverse, terminal stigma, and there are two petaloid crests or appendages to each. Succeeding the flower we have a trigonal or hexagonal capsule, which is sometimes beaked, and it contains seeds that are more or less globose.

Leaving these dry details—which, however, may not be dry if the reader will examine the flower itself—we may turn to matters of great interest and importance. Let us ask first of all, What is the meaning of a showy flower like this? As in the case of every other flower, its object, of course, is to produce seed, but as to its showiness we can only say that it has no meaning except in connection with insects. Pollen must be carried from one flower to another, and the insects must not only be rewarded by the honey they get, but they must also be attracted. About this necessity of cross-pollination, as it is called, there is much discussion, but, to prove the point, we have only to observe that plants which have any other means for the transference of pollen never



IRIS LUTESCENS

STRUCTURE AND NATURAL HISTORY 3

have showy flowers. Many plants are entirely sterile with pollen from the same individual, and, whether it is necessary or not, it is always of advantage that pollen should come from another individual plant.

To carry out this transference of pollen, Irises usually engage the service of bees. It is said that our own "Yellow Flag" was originally adapted for bees, as its dimensions show, but that since, to a great extent, it has become adapted for flies (*Rhingia*).

Take an Iris flower and observe that a bee, of the right size, pressing in (to extract honey) below the arch of the style-arm must necessarily sweep off, on its back, some of the pollen from the anther, which is exactly placed for the purpose. Then observe that this bee, on entering another flower, must necessarily leave some pollen on the stigmatic lip, which is exactly placed so as to be most sure of sweeping it off. The arrangement is remarkably perfect, it is a great achievement in evolution, and its existence compels belief in the necessity of the function which alone it is designed to meet.

CHAPTER II

THE IRIS GARDEN

HARDY flowers, after many years of neglect, have long since captured the affections and regard of all classes of society, yet even to-day we witness an increasing love for them which promises well for the intelligent gardening of the future. While many beautiful flowers were lost sight of during a considerable part of the recently closed century, Irises were always more or less popular—at any rate in cottage gardens—and probably there is no out-door genus of plants which can vie with Iris for the number of its good qualities. One kind or another will be found in flower over quite nine months of the year. Many kinds are exceedingly beautiful, and some, indeed, have no rival in point of beauty; a large number are so easy to grow that success is certain by any cultivator in any garden, yet others present difficulties which worthily excite the continued perseverance of the most skilful of gardeners. There is no merit, perhaps, in any plant for its difficulty of culture, but those here referred to have a rich reward for those who attain success. It is a genus *par excellence* for the intellectual specialist, and nothing, at the present time, is more to be desired in the interests of horticulture than a large increase in the number of specialists in all classes of plants. It is with this idea that we think of the Iris garden. Many people are far too narrow and limited in their interests, indeed we are compelled to admit that many are satisfied with mere prettiness, and really care nothing about the



A GROUP OF SPANISH IRISES

flowers with which their "furnishing" or "decoration" is accomplished. Better this interest than none, but it is not satisfactory, and we can but desire the development of a higher level of intelligent appreciation. May it be hoped that this book will excite some real interest in this one genus? If so there is some reward for having written it.

There are few gardens in which the members of this genus are dominant. Sir Michael Foster alone has demonstrated how much may be done with Irises in making a garden, and perhaps it is of equal importance that he has shown how a great speciality may be kept up without excluding a large variety of other choice plants. A garden of only one line of interest is not to be advocated, and in many, added to other features, we find that of a Rose garden. Why should we not have, as a variant, an Iris garden? Truly, it may be said, without depreciating the "Queen of Flowers," that Irises are quite equal to Roses in the pleasure they may afford. There is no garden in which some Irises may not be especially suited. A good loamy soil suits the majority; most of them certainly are fond of lime, but where no lime is, there is the place for the many magnificent forms of *Iris laevigata*—provided, of course, that moisture is available. The late Mr G. F. Wilson made a most magnificent display at Wisley Wood, now the property of the Royal Horticultural Society, and it has been said that this place was "more beautiful with flowering Irises than the Homeric meadows of Elysium ever could have been with Asphodels." Most Irises love sun, and they love good drainage, so that even on a hill great results may be obtained. It is even possible to say that the absence of soil may conduce to success, for then it is that beds and borders have to be made, and the opportunity is presented for making them of good material, sufficiently deep, and well drained. Some Irises may even be grown

on a prepared roof, but the present writer is unable to recommend this or any similar situation, unless the Irises are required to serve a special purpose. In China and Japan *I. tectorum* is cultivated on roofs, by some, it is said to be, for the purpose of warding off pestilence, others say that the object is to strengthen the thatch. Mrs Hugh Fraser, in her book of Japanese Tales, states how Irises in Japan came to be grown on thatched roofs.

"Once there was a famine in the land and it was forbidden to plant in the ground anything that could not be used as food. The frivolous Irises only supply the powder with which the women whiten their faces, but their little ladyships could not be cheated of that. 'Must we look like frights as well as die of hunger?' they cried, and so every woman set a tiny plantation of Irises on the roof of her house, and there in most country places they are growing still."

Some of the Pogoniris group do very well in small depth of soil, and may be used for roof cultivation. Certain kinds are very suitable for marsh and water gardens, and even require the wetness there provided. On moist ground we should have all the best forms of *Iris sibirica*, the peculiar *I. fulva*, and the comparatively new *I. albopurpurea*, while *I. laevigata*, if there is no lime or chalk, will probably make the great feature of this now somewhat popular kind of garden. In the water, or near it, our native *I. Pseudacorus* is exceedingly effective as a "flag"; its bright yellow flowers are valuable for their colour.

Notwithstanding the fact that Irises may be selected for the conditions already existing in any garden, we still require certain means and conveniences for the enjoyment of a collection or selection of the best kinds, and our proper enthusiasm can be satisfied with no less than all the best. Situation and aspect, from this point of view, are distinctly important. Shelter from keen and

cutting winds—from the rude blasts which come from the east when our best flowers are out in the spring—is always desirable, and whether it is provided by brick walls or by trees and thick shrubs, does not perhaps matter much. Except for the few, sun must have full access, and perhaps for aspect a slope to the south is most desirable, though not essential. We should claim the south borders frequently found in front of plant-houses, and here, especially if shelter is afforded by projecting houses on each side, we have an ideal position for *Oncocyclis* Irises. Many of the bulbous Irises are also well suited in a somewhat similar position, because of the protection easily afforded by lights at the right time, though, as well known, the “English” and “Spanish” Irises and some others do quite well in the open. Dwarf walls are often useful, because we may rest lights against them, without much trouble, to keep off wet, though this support is given by walls of any height if not already occupied by trees and creepers. Certain Irises, *e.g.* the *Oncocyclis*, must be dry at certain times, and if lights cannot be supported as pointed out above, it is necessary to have movable frames; or by the exercise of a little ingenuity lights may be made to meet at the top over a bed, span-roof fashion, when required. For raising seeds frames are very useful, or they may be raised in a greenhouse, but there is advantage in sowing in free ground, over which a frame may be placed, if seeds are sufficiently numerous. A few seeds only of any one kind must of course be sown in a pot. A greenhouse is always a most desirable structure because there we may enjoy a number of the best bulbous Irises and numerous other kinds which flower during winter and spring. Many bulbous Irises are fairly cheap and are easily flowered in pots, but it cannot be said that good bulbs, for another year, are to be expected. At Kew, in the very interesting “Alpine” house, several kinds may

often be found in flower in the spring, and these are not limited to bulbous Irises, but include some of the smaller of the Pogoniris group. Forcing is not usually to be recommended, indeed bulbous Irises cannot be said to force, but some others may be had in flower long before they could flower out-of-doors. Some allies of *I. germanica* I have forced for strictly botanical purposes, and have found that they bear a temperature of 60° or 65° very well.

In the arrangement of an Iris garden for ornamental effect, much must depend upon individual taste as well as upon the surroundings. Irises are usually much the more effective if they are planted in groups or masses of the same kind. A line of a large growing handsome form in front of a hedge looks extremely well, and fairly large beds of selected kinds are very effective. Those of the *Pumila* group may be massed in beds and *I. pumila caerulea*, for instance, is capable of forming a most attractive sheet of colour. Long beds on grass are not only effective but very convenient; if about six feet wide the plants are easily reached from either side. As a rule it is desirable to avoid any mixture of kinds which flower at different times, or which vary in stature and habit. Irises are exceedingly lovely for vases, and some of the best should always be within reach from a gravel path, so that buds for opening in water may be cut at any time without treading on wet grass. Open flowers may be gathered, but the most perfect flowers are often those which expand indoors.

It should hardly be necessary to advocate either careful labelling or the adoption of a good label, for much of the pleasure of the garden is lost if names are not preserved. Wood labels do very well for pots, if renewed when necessary, but for out-door use they are not sufficiently durable. Porcelain is too easily broken; cast zinc labels or stamped zinc labels are exceedingly

good, but are perhaps a little expensive. A good label is made of wood with wire legs, but for a cheap and durable label, not too obtrusive, I recommend zinc, written upon with a suitable ink—certainly not the green ink usually sold in shops. A label that costs little and which will preserve the writing easily legible for twenty-five and perhaps thirty years is not to be despised. Labels of sheet zinc will do this if written upon with a solution of bi-chloride of platinum, 16 grains to the ounce of distilled water. A quill pen should be used to write with. Some years ago I experimented largely with labels, and here let me give a hint. Use a best brand of zinc—Vieille Montagne, perhaps—and insist upon its being delivered in brown paper so as to avoid all the tarnish that is possible. In the ink put a few drops of hydrochloric acid and any ordinary film of tarnish or dirt will be bitten through as the writing goes on. The colour of the ink is orange, but when it touches the zinc a deep dead black should instantly appear. A coat of good carriage varnish may be laid on by the finger, and when this is dry the label is ready for use. Complaints are sometimes made of a kind of encrustation which obscures the name, but this in the Cambridge Botanic Gardens, where many thousands of these labels are in use, is practically never noticeable. The one drawback is, that if the coat of varnish disappears and is not renewed, it may be necessary to wet the label in order to read the name. It is not always so, but some drawback must be expected in a label so cheap as this is. I have assumed that the labels will be made at home; indeed they ought to be, for with proper shears the zinc—thickness No. 11 it should be—can be cut as easily as paper, and there need be no waste. In order to strengthen the stem of these labels for pushing into the ground, I make a groove or corrugation by means of an iron block with a channel, the label being

laid over the channel and then a stout wire, which, being sharply struck with a hammer, causes the zinc to take the desired form. The accompanying illustration requires little explanation.

1. A good border label with grooved stem.
2. The same as last but smaller. Was taken from a bed and photographed after many years' exposure, without cleaning or preparation.
3. A convenient label for pots or border, the lower part grooved.
4. A good label for hanging to a branch. The end is rolled and the wire put through the tube thus formed.
5. A good label (with long wire stem) for aquatics or for scrubby vegetation, above which the label stands clear. The label swings on a coil of the wire and is easily removed. The metal is doubled before the hole is made.
6. A label good for trees. The bend over at the top prevents the soiling of the face by birds.
- 7 and 8. The pieces cut off in making Nos. 1 and 2. They make good pot labels as they are.
9. The iron block and stout wire for forming the groove.
10. The shears. The lower vertical part goes into a socket at the side of the bench.

Selection of the most ornamental species for general cultivation, all easily grown, the *Oncocyclus* section excepted.

N.B.—Garden forms are given under the species to which they respectively belong in Part II.

Apogon.

I. unguicularis.
(I. stylosa.)

ruthenica.
sibirica.
longipetala.



FORMS OF ZINC LABELS AND APPARATUS FOR MARKING

Apogon (continued).

longipetala montana.

(I. missouriensis of
many collections.)

Pseudacorus.

laevigata.

(I. Kaempferi.)

foetidissima,—for fruit.

spuria (best forms).

aurea.

Monnieri.

orientalis.

(I. ochroleuca)

— gigantea.

Evansia.

japonica.

Milesi.

tectorum.

Oncocyclus.

paradoxa.

iberica.

susiana.

Lorteti.

Gatesi.

sofarana.

Regelia.

Leichtlini.

Korolkowi.

Pogoniris.

pumila.

Chamaeiris.

biflora.

lutescens.

Cengialti.

variegata.

benacensis.

sambucina.

germanica.

kashmiriana.

neglecta.

hybrida.

cypriana.

florentina.

pallida.

— dalmatica.

plicata.

Xiphion.

Xiphium.

xiphioides.

juncea.

Bakeriana.

reticulata.

— Histrio.

— Krelagei.

and other vars.

Juno.

orchiioides.

Warleyensis.

bucharica.

sindjarensis.

Tubergeniana.

Willmottiana.

Rosenbachiana.

persica.

Tauri.

stenophylla.

Selections of species for special conditions.

*Shade.*I. foetidissima (fruit orna-
mental).

verna.

fulva.

albopurpurea.

sibirica.

*Watery places.*I. laevigata.
(I. Kaempferi.)

Pseudacorus.

*Greenhouse, on account of tenderness.*I. hexagona (planted out).
japonica (in pots or plan-
ted out).

Ornamental species for flowering in pots.

I. unguicularis.
(I. stylosa.)

japonica.

tectorum.

pumila.

Chamaeiris.

Xiphium (Spanish Iris).

Bakeriana.

reticulata.

persica.

Tauri.

stenophylla.

alata.

I. unguicularis does exceedingly well planted out on a
greenhouse border.



IRIS ORIENTALIS

CHAPTER III

ON THE CULTIVATION OF ONCOCYCLUS IRISES

I THERE are some things which you have only to stick in the ground and the rest follows with the utmost regularity—bud—blossom—fruit are mere matters of course—the end may be taken for granted from the beginning ; but this cannot be said with any truthfulness at all about the subject of these remarks—there are all sorts and kinds of ways by which the cultivator may go wrong, and only if the idiosyncrasies of the flowers are consulted will they ever prosper at all ; and yet it does seem to me after handling them for a long time that it is not a case of a “forlorn hope,” as some have judged it to be.

I have known gardeners who have pitched these plants away in exasperation—almost in disgust—and who have declared that they will never spend any more time or trouble over such ungrateful beings. The truth is that *Oncocyclus Irises* must be considered to be very exacting creatures indeed—they will have what they will have—there is seldom any such thing as compromise on their part ; but if you comply with their demands they reward you handsomely—for not only as I think is their beauty quite a thing by itself—and about this there will be more said hereafter—but if they live at all they grow and grow and grow and you soon have very fine plants—to use a very familiar expression, it is all with them neck or nothing ; they either fail and then soon after quite pass away or they go on with a good deal of regularity

and surprise you with an apparition for which you were unprepared. It is this latter circumstance which makes it so much worth while to do a great deal in their behalf. The reward for success is not measured out on their part in any half-hearted or stinted degree, but is satisfying and large. I confess when I first made the acquaintance of *Oncocyclus Irises* a very long time ago I thought that by comparison with them I never had seen anything beautiful at all—certainly not in the way of flowers; and though an egret's wing or the hollow of a shell would stand for a good deal, yet the freshness of the Iris blossom, the quaintness of its shape, the contrasts it presents, the very refined markings which are so peculiarly its own, for the most part its subdued and delicate colours are sufficient to make it distance everything else that I have ever known, and in a figurative way I could almost fall down and worship it. I remember a good many years ago when I was out for a ramble on the Continent with my wife in the month of May that we arrived one evening rather late at the Mecca of gardeners—I mean of course Baden-Baden—and I only had time to pay my respects to the Magician who lives there and to ask leave of him that we might visit the “Jardin Botanique” on the following day; this was at once readily given, and I soon after retired to rest with a fine prospect before me. Very early on a transparently clear and most delightful May morning I got up and passed through the well-known little gate into the enclosure which contains more exceptional and highly interesting floral treasures than any other garden in Europe. I knew not what there was to be seen, but from former experience I was sure I should find a great deal; and so it was, only former experience was completely distanced at once. For the first time in my life I came across a very fine specimen of *Iris Lorteti* at the zenith of its beauty with its pale grey lilac falls, its

dark brown spot about the throat, its orbicular standards which are of a pale grey colour most delicately veined with red-brown, and I thought I had never before seen anything to come up to this, it distanced everything else whatever it may have been: at last the τὸ καλὸν had been found.

I left the garden at once—there was room for nothing else in my mind at the same time—and I fetched my wife from the hotel in hot haste, and before she had been able to breakfast, lest any accident or unlooked-for occurrence should deprive her of a sight which she might never see again. From that time to this, *Iris Lorteti* has reigned supreme in my affections—though it has been closely run by two or three near relatives of its own—upon occasion *Iris iberica* and some others have gone far to equal it.

But now came the real difficulty of the affair—for I had often tried to grow these Irises before, and I have had many and many a disappointment to deplore; these *Oncocyclus* Irises made such a very deep impression on my mind, that I almost registered a vow that I would never leave them alone while the smallest chance remained to me of doing them well. It should be said here that I possess and work in a garden which has been appropriately called a veritable sun-trap, and I therefore judged that I had as good a chance of prospering with these beautiful flowers as anybody could have in the British Isles. I put therefore first and foremost as a desideratum in the way of cultivation which must be taken into account, a bright sunny exposure.

I would advise no one to waste time or money on *Oncocyclus* Irises who lives in a low-lying or wettish locality—I think they would damp off very soon, and any notion on their part of posing as aquatics is very far distant. But, given the ordinary amount of sunshine which is to be met with in the Southern and Midland counties of England, and I should say that the prospect

is favourable if only other things be right. I would recommend any one who lives in such parts of the world as Westmorland or Cumberland to take up with *Cypripedium spectabile* or *Myosotidium nobile* (if it be hardy enough), rather than to think of growing *Iris Lorteti* or *Iris iberica* among his treasures.

II. Another point to be insisted on is that these Irises must be grown in frames—or, at any rate, they must have a shelter of some sort—not during the winter, but rather the summer months. The reason is this: soon after they have blossomed—and much too soon for their own good—they will grow again in this country if no protection is offered—they come, for the most part, from very hot regions of the earth, and when they die down they are baked hard by the burning rays of the sun, and for long weeks and months together all chance of growth is denied to them. But this is the very thing which is best and most suitable to their case; perfect rest is enforced, and for a long period of time they remain quite quiet, and have no thought of movement at all. And let us contrast this with what would happen here in any ordinary year. Some passing thunderstorm and rain, which is so frequent in July, may flood the whole country round, and though soon afterwards the land may be dried up again, the Irises will have begun to grow, and great harm has been done to them. It is, therefore, absolutely necessary to put some covering over their heads soon after they have blossomed, so as to enforce rest upon them—at all events, it is necessary to do this unless an alternative plan be adopted, which I do not like at all. I refer to what is called the taking-up system, which may be followed if there is nothing better to offer, but for which I do not care myself. According to this treatment, when the Irises have blossomed and the foliage has died down, the rhizomes are dug up out of the ground, and are put on the greenhouse shelf till the time for planting

them has come round in the autumn. It is not to be denied that they will succeed after a fashion with this mode of culture—but the contention, on the other hand, is that they never can do themselves justice when they are treated in this way, and the reason for it is quite obvious; they take a long time to anchor themselves in the ground, and beyond everything else, they hate to be disturbed or tampered with in any way. It was an oracular saying of Herr Max Leichtlin, which he uttered a long time ago, but which should be as much respected now as when it fell from his lips, “Oncocyclus do not like to be disturbed”; and if that does happen, they lose for a time fulness—the magnificence which they would otherwise have. I am sure that any one who has seen the blossoms of these Irises which have come from plants that have been long seated in one place, and others which have been taken from such as have been regularly moved, would say at once, if I grow these things at all I never will be contented with a makeshift and half-hearted sort of process, I will either find out how to do the thing properly, or I will leave it all alone, and I will turn my hand to something else. The following are Sir Michael Foster’s words, who knows more about this matter than any one else, and who is treating it from another point of view: “If these Irises are taken up and are replanted somewhat early, the stimulus of the warm autumnal soil goads them into active growth, so that they try to make up for the time lost while they were on the greenhouse shelf, and soon the cold of winter bruises and spoils them; or if they be planted late, the hand of winter is upon them before they have had time to anchor themselves by new roots, and frost thrusts them out of the ground; and even if this be prevented by careful covering and the like, they are not so ready as plants which have remained in the ground to avail themselves of the forces of spring when these at last come.” And

all this is indisputably true, and should govern any measures that may be taken on their behalf. The Irises have a much better chance of braving successfully the rigours and the disagreeableness of an English winter, if they are well established in the ground long before it begins, than ever could be the case if they have only a very slight foothold in it and a precarious tenure. But then all this necessitates their being grown in frames, and, at all events, they must have some shelter over their heads in summer. It is not to be supposed that they will ever do quite well in the open all the year round, as so many of their congeners do—their nature, their habits, their way of growing are peculiarly their own—and in our artificial way of treating them we must find some method of enforcing on them rest for a sufficient length of time.

III. Another point of primary significance, if they be grown in frames, is that the drainage should be good, and ample ventilation be afforded at all times. Anything like a stuffy or confined mode of treatment is sure to be fatal to them. I do my best to keep them quite dry for a sufficient length of time after flowering, but I never by any chance shut them up closely or deprive them of a full current of air—the sides of my frames are always left open and there are ventilators placed at the back of them; the plants are protected from any torrents of rain, and besides this and a covering overhead, nothing is done to them.

But drainage is very carefully considered, and if there were any flaw on this head it would invalidate everything. These *Oncocyclus* Irises can never bear to be water-logged—they simply perish offhand if they have any standing water about them. On this account when my frames were constructed, some rather elaborate steps were taken to make sure that the water could run quickly away—broken brickbats and large stones

were put in for a foundation to some little depth, and on the top of them sods of grass were placed bottom upwards so as to prevent the earth getting in and blocking up the interstices below; above this came the properly prepared soil about which I shall speak hereafter, and the drainage was so laid down that no rain could settle among the roots but it should run quickly away. It is not at all difficult to manage this in reality, though a written description of it seems to imply trouble at once.

I have never had any disappointment on this head, and the plants have been very successfully kept from any stagnant water about their roots; it should be added perhaps that the surface of my beds in the frames is carefully raised a few inches above the surrounding level, and this very greatly helps in throwing off the rains. I again say that this point must be carefully attended to, for nothing will go well if there is here a muddle of any sort.

IV. Another practice which I follow and which should not be overlooked is that of making the beds very hard and firm where the Irises are to be placed. I did not take this in at first when I began to attend to their cultivation, and I am sure I lost by my negligence in this respect, though I was quite unaware of it. I am now very much alive to the advisability of very firm planting, and my gardener and I think no trouble too great so as to make sure of it. We remember that *Oncocyclus Irises* never grant any pardon for an omission of duty regarding them, and we try to leave them no excuse for being sulky in our hands. When the compost for the Irises has been prepared it is thrown into the frames and then it is beaten down with spades with all the force at our command, and lest this should not be enough the whole surface of the beds is covered with thick boards, and I get men to stamp on them and

in this way to compress the soil as much as is possible. Before we have done with it the whole interior of a frame is as hard and solid as a rock, and any roots which make their way in it are in no danger of being shifted about—they have as firm an anchorage as could be desired. And this is just what these creatures like, and no one should think that mere fussiness has been at work in the effort. I say again and again they are only to be conquered by attention to little things, and they must have *all* their desires fulfilled. Let any one who doubts about what I say make experiments with two *Oncocyclus* Irises and plant one in loose pliable soil and plant another in some rock-like substance which has been prepared after the manner set forth above, and then note how the plants will behave. My gardener and I hold it as a sort of axiom in their cultivation that very firm planting must be adopted. Nor let it be forgotten while planting is under review that the rhizomes should never be deeply covered up. No Iris that I know anything about likes to be very deeply buried—and *Oncocyclus* Irises are all apiece with the others in this respect—they must be sufficiently protected from the frost, and no more should be thought of.

V. I come now to a very important consideration indeed—in fact, it is the turning-point of everything—but, strangely enough, until quite lately, it has been left out of sight and very small attention was paid to it. I may say for myself that I thought the question of soil was in this case of very trifling moment, and that if other things, such as I have described, were attended to, the rest would be well; or, at any rate, I supposed that the soil had not much to do with the matter either one way or the other. If I may speak of things in this very small relation which are of transcendent and universal importance, I may add that I have somewhere read that a slip, which was an *obiter dictum* of the great philosopher, Sir

Isaac Newton, put back the advance of astronomical science in one direction for a hundred years. He was wrong in this one particular, but so convincing was his opinion and name, that nobody thought of questioning anything that fell from him, whatever it might be—and for once in a way he erred. It was exactly so in this matter I am considering, though it has only the weight of a feather in the scale. The one mistake had to do with infinities, the other with the most utter triviality by their side; but in both the misapprehension of a master, who was looked upon as an infallible authority, led others astray. I heard it said about the cultivation of *Oncocyclus Irises*, in the early days of attention being paid to them: "I do not think the question of soil has much to do with the matter; success depends on other considerations"—and as anything which Herr Max Leichtlin says about questions of horticulture is received as final by me at once, I put this safely by in the recesses of my brain, and I have treated it as an axiomatic principle from that time to this. I am not the only person who came to exactly the same conclusion about exactly the same thing in the selfsame way—but it was in some measure our own fault. I have said that the speech I have referred to was made a very long time ago, and it may have been modified or altered between this and then; at any rate, I do not suppose it was intended to bar all investigation on one point, as has been the case. I blame myself for not wondering a long time ago if first principles were quite so sure as I had supposed them to be. It was the excessive veneration which I feel for anything that comes from the Magician of Baden Baden which stopped me at this point, and I again repeat that what I refer to was said a very long time ago. If I had seen him lately, so as to speak to him about this matter, it might have been very different. I dare say he has long since found out what

we now have only recently come to. For everybody knows that plants may be divided into two great classes—those which hate and those which affect lime in the soil—a third class being indifferent to its presence either one way or the other. When, therefore, I was led to believe that any question of soil has very little indeed to do with this matter, I never gave a single thought to the presence or the absence of lime; but I dwelt in my mind upon drainage, upon shelter in the summer, upon other things which have been referred to above to the exclusion of everything else; and I may say here that, in those early days when the cultivation of *Oncocyclus* Irises was like darkness visible, so difficult did it seem to be, a chance word from Sir Michael Foster himself rather helped to take me the wrong way. He wrote in *The Garden* of November 28, 1891, about a spot near Cambridge, where *Iris susiana* does well, "Yet there must be something in the place in question, something in the conditions—*something, perhaps, in the soil; and, if so, probably something in the physical rather than in the chemical nature of the soil which determines success,*" etc. But this is the very point on which I should now respectfully join issue with him, and I dare say he has himself long since found out that it may be more or less modified. It is the chemical nature of the soil which I now thoroughly believe to be a *sine quâ non* if there is to be any success at all with these magnificent Irises, and if this be wrong, and all other things be quite right, I do not imagine that much good will come to them. At any rate, for years and years I and others have been "pegging away," but with strange vicissitudes in the way of results. Sometimes I have had fine blossoms in the spring, and when I thought I had got to the top of the hill, like the stone of Sisyphus, I have been rolled down again to the bottom; hope has been damped over and over again when it was beginning to rise very high, and I had every

chance of making myself a bankrupt over these flowers, for I never could leave them alone. One year a terrible catastrophe ensued, and really it made me waver for a little. A great authority said, and I can quite believe he was right in his words, that weak manure water is highly beneficial to these Irises in the month of April when they are in a growing state. I repeated this to my gardener, but without any safeguards at all, and I do not know what he did; but I soon found Iris after Iris in a very low, and then despairing, and then moribund state; and my whole collection was wiped out. It was my own fault, for I ought to have seen the thing done properly, if at all, and I dare say the manure water which was given to them was much too strong. But thus it has gone on with very varying fortunes. There has often been enough of prosperity to make me think I was about to turn the corner at last, and then dark clouds would gather, and I felt I must give it all up; but when it came to the point I never could give it up. *Iris Lorteti* and *Iris iberica* and *Iris Gatesii* and others had completely thrown a spell over me, and for twenty years and more, I should think, as soon as autumn came round, I began to read up all the catalogues I could get hold of, and again to go to work as though no harm had occurred.

But I have not been wrong in the full and determined belief that some day or other these plants would be quite manageable. Perhaps some one may say to me you may be mistaken now as you have been before, and you will have chaos to deal with again. I do not know, and all I pretend to say is it may be so, but I do not think it; there is far better ground now for reading prosperity into this matter than there has ever yet been, and more than that I can point to my plants which are at this moment as strong and as happy as plants can be; there is a very different situation in Ryde to-day from what has ever

been known there during the last twenty years. And this is the way in which the great change for good came about so far as I am concerned.

A friend of mine who is fond of flowers took it into his head to grow *Oncocylus Irises*, and as he knew little about the difficulties of the task he used the first soil that came to his hand—luckily he was adding a wing to his house and heaps of old mortar and such like were lying about the place of which he freely availed himself. I noticed when the flowering time came round in the following spring that he had largely succeeded, and his *Irises* gave him better results than mine did, with much less of care. I then bethought me of what I had heard before, which tended the same way. Mr Potter, the foreman of Messrs Backhouse at York, has to do with two gardens, one in Oxfordshire and the other in York. In the former of these two gardens (at Witney, I think), *Iris iberica* grows like a weed; in the other it will not grow at all: and he can only account for it by saying, in the one place it meets with plenty of lime, in the other it has none—and when I was thinking of all this and trying to put two and two together I received a letter from a friend in which these words occur: “From what I can see of my *Oncocylus Irises* this year and the past season, I get more and more convinced that the want of lime in our soils is one of the chief causes of failure in their cultivation, &c., &c.” Here was a revelation indeed, and it all tallied with my own reflections—at the same time suspicions were excited which could not easily be laid to rest, and which were strengthened from day to day.

E. J., a correspondent to whom I had written about the matter, sent me word to the effect that he had met Mr Potter in travelling by rail, who had said that not only does *Iris iberica* continue to exist when it is growing in chalky soil, but it cannot be killed in it. This seemed

to be conclusive enough, and I determined at once to put it all to the test and to be guided entirely by the results that might follow, and this is just what has happened. It seemed to me that bone meal would be as good a food as any which I could get for my plants, and if they like lime at all they would respond to its use. I accordingly sent for a large sack of bone meal to Messrs Clay of Stratford, near London, and I distributed 112 lbs. of it between four large frames, giving to each one 28 lbs. or thereabouts. These frames I should say are 12 feet long, 3 or $3\frac{1}{2}$ feet wide and have a depth of about $1\frac{1}{2}$ feet. The bone meal was thoroughly mixed and incorporated with the loam which was put into the frames, and the Irises were planted in September last towards the end of the month, and now what followed during last winter and spring? I can only say there have been no sudden failures and consequent disappearances as so often has been the case before. I have certainly not lost more than one Iris to my knowledge, or at the outside two, out of several hundred plants which I am growing, and this being the case it is more than possible that this one or two may have been ill before they came into my hands, and not only so, the whole lot looks as if it were in the rudest health and doing exceptionally well. The colour of the foliage is good and I know not of a single drawback which should be mentioned here, on the contrary I may say that my garden was visited last spring by several persons who had an exceptional knowledge of these things, and they all declared themselves quite pleased with what they saw.

It is only right that I should mention here, which I am quite pleased to do, that curiously enough this matter has been taken up very seriously on the Continent, simultaneously with our efforts regarding it, but quite independently of them. M. Van Tubergen, junior, was

struck by the fact that *Oncocyclus* Irises were given to fail at unexpected times and in unexpected ways beyond any others of their race, and he determined to spare no trouble and to avoid no expense that the secret of success might be revealed. He also had last year come to the suspicion that it had a good deal to do with the presence or absence of lime in the soil, and he proceeded to put this to the test—he filled some large beds with composts of very different kinds and he registered the results—he also went the length of procuring some soil from the natural habitats of the flowers, and he subjected it to a very vigorous analysis of his own. This may be taken, I should think, to have quite settled the matter, the proportion of lime in the Iris' homes stands in a relation of about 150 to 5 out of 1000 parts when compared with what is found in such a country as Holland. The principal point still left open by him, so far as I know, is if magnesium be required, but it scarcely would seem to be so if the look of the Irises be considered, which have had nothing to do with it.

No doubt revelations on minor points may be forthcoming, and nobody would assert that the last word has been said about this matter, but it is a great thing to feel a hope—nay a very confident expectation—that if certain plain rules be adopted in the cultivation of *Oncocyclus* Irises, they will not now be followed in vain; and what pleasure they give in the opening months of spring! Perhaps the fact that they have eluded us so long may quicken the admiration to which they always give birth. They seem, at any rate to me, to be in advance of all other flowers; there is a refinement, a delicacy about them which belongs to nothing else; and I have frequently seen men and women almost poring over my frames in a kind of speechless astonishment. It may, perhaps, be as well to say in conclusion that some little

care should be taken that they do not suffer when in blossom from the brilliancy of the sun, at any rate their time of expansion would be lengthened if this could be got over. I have never yet tried it, but I am thinking of providing them next spring with a covering of tiffany, or something like it, during the blossoming season and I believe this will do good.

I hope that more and more, at any rate in any garden where sunshine abounds, the cultivation of *Oncocyclus Irises* will be pursued—they distance everything else that I have seen in the way of giving delight.

HENRY EWBank.

CHAPTER IV

CULTIVATION

A.—CALIFORNIAN IRISES.

SOME of these are difficult to grow and instructions that will always ensure success can hardly be given. Mr John Hoog writing in *The Garden*, Sept. 22, 1900, p. 219, on *I. Hartwegi* says, "This, like the other Californian Irises, may be easily raised from seeds sown in the open in the autumn. The seedlings will appear next year about May, and by the end of the summer will have grown into nice young plants. In Messrs Van Tubergen's nursery it has been found that curiously enough these seedling plants will come through the winter unscathed, if slightly protected, but that late spring frosts about April or May prove fatal to them. The seedling plants are consequently taken up in the autumn and planted out in pits, where they are allowed to stand unmoved for several years, and in our deep rich sandy soil they succeed to perfection. Special care is, of course, always taken that the sharp frosts which occasionally occur about the end of March and the beginning of April cannot touch the plants. Imported plants from California of the whole of this group, with the exception perhaps of *I. Douglasiana*, which is a very robust species, seem to have very little chance of living and becoming re-established in our climate. I may add that this very peculiar Iris group cannot exist when

there is much lime in the soil." This is a valuable communication, and the plan of raising from seed must be emphasized because many plants are all the better for a new lease of life thus provided—if thus it may be expressed. With regard to lime in the soil it may be noted that this cannot be a sole cause of the failure of *I. Douglasiana*, because I know of a soil in Gloucestershire, strongly impregnated with lime, in which it does well. For this species I think it may be said that moisture in some certain degree is necessary in this country, though wet no doubt must be avoided. Mr Carl Purdy says that it grows on the cool northern slopes in the woods or along the cooler canyons in a well-drained soil, usually clayey, but often gravelly or composed of rocky *débris* and leafmould. He says in *The Garden* of Dec. 5, 1896, that he has had it in cultivation for some years and has never seen wild plants to match his own. They are growing in a cool corner among ferns in a rich soil of clay and compost. *I. longipetala* he has no difficulty in establishing, but this does perfectly well on the ordinary dry bed of the Cambridge Botanic Garden. Writing on *I. macrosiphon*, *I. Douglasiana* and *I. Hartwegi*, also in the same number of *The Garden*, this gentleman says, "I am afraid that most of your cultivators have made the mistake of planting in too heavy a soil and giving too much water. From what I have said it can be seen that these species come from regions very dry in summer, that they grow in well-drained soils and make their growth in the winter and spring in their native homes." This latter remark explains no doubt the greater part of the difficulty of growing these species. Continuing he writes: In the summer they ripen up hard and the roots become dry and wiry. With the coming of cool weather and moisture in the fall, they at once start into growth. . . . Success with these Irises is to be found in giving them sunny quarters and not too much water, and

transplanting just when they start into growth.”¹ In another note in *The Garden* of Jan. 1, 1898, Mr Purdy tells us his conclusion that *I. Douglasiana* and *I. Purdyi* do best in a heavy soil, and handle easily; but that *I. californica*, *I. Hartwegi* and all others of the species growing in dry situations and loose soil require perfect drainage, and are best moved dormant. As to the time of moving this may be right for California but certainly in this country *I. Hartwegi* must be moved in the spring, say in April, as proved both by the late Rev. H. Ewbank and Herr Max Leichtlin. It is a general truth that Irises should be planted when just growing, or immediately about to grow. Mr Purdy shows elsewhere that his practice is really the same, difference of climate being allowed for.

B.—IRIS LAEVIGATA.

(*I. Kaempferi*.)

THE season of its greatest beauty is usually in the end of June and beginning of July, but by planting in some shade the flowering period may be made to extend to two months. Generally speaking it may be said to do well in rich soil, free from lime, where the roots can find abundant moisture during the season of growth. Mulching is of great value if moisture is likely to fail. The greatest and perhaps most successful grower of this species was the late Mr G. F. Wilson, F.R.S., at the famous Wisley Wood. His own words in the *Gardeners' Chronicle* of Feb. 18th, 1893, p. 204, may be quoted to show the manner of his cultivation. “Having occasion to take a damp field into the garden, I partially

¹ Subsequently in *The Garden* Mr Carrington Ley draws attention to some discrepancy of nomenclature between *I. Douglasiana* and *I. macrosiphon*, as understood by Mr Purdy, but as he is here writing on both species the question of cultivation is not affected.

drained it by means of a wide ditch, on the banks of which were planted seedling Rhododendrons, and on the sloping sides, down to the water's edge, about 700 clumps of seedling Japanese Irises; and the field itself proving wetter than was expected, was planted with between 3000 and 4000 more clumps of the seedling Irises, and according to present appearances there is every probability of my being able, about the end of June, to send you a photograph much in the style of your picture." The picture here referred to is that of a Japanese plantation, on p. 169 of the preceding week's issue. Mr Wilson's hope was no doubt justified, and in the *Chronicle* of Oct. 21st of the same year appeared a charming view. Mr Wilson's experience was that the plants thrive with water actually at the roots during winter, but the better practice is probably to flood during summer once in twenty-four hours where that can be done, leaving the ground only moist for the winter. A ditch with the end capable of being blocked would no doubt provide the means admirably, but in many gardens it would be easy no doubt to plant in low beds which can be flooded at will.

Messrs Boehmer and Co., of Yokohama, who have large fields under cultivation, recommend very rich clay soil with plenty of water during the growing season, which with them extends from April to June. They recommend that the water shall be an inch deep over the soil during the growing season, but turned off during the night. In winter they say the roots should be kept almost quite dry. This certainly is not necessary in this country, and it may be pointed out that—moisture provided, perhaps also with the absence of lime—this Iris succeeds under some variation of treatment. One cultivator recommends the removal of the kind of soil desired by Messrs Boehmer & Co., and uses a compost of half peat, half leaf mould, with manure a

fourth part of the whole. Yet another cultivator recommends light loam with equal parts of peat and leaf soil. Returning again to the point that this Iris will succeed under varying conditions, it is worth pointing out that on Long Island it succeeds under conditions the reverse of aquatic, viz., on a gravelly knoll in full sun, but it may be taken for granted, I think, that moisture is within easy reach of the roots; but, with heavy mulchings, even a dry soil is worth trying if no other can be provided. It is worth note that shelter and protection from keen east winds is desirable.

In *The Garden* of Feb. 18, 1899, p. 105, is given a beautiful illustration of the Iris garden at Horikiri, Tokio, from photograph sent by Messrs L. Boehmer & Co., of Yokohama. Mr E. Jenkins, a clever cultivator and the writer of the accompanying article, says he never uses peat, and strongly condemns the practice of saturation with water. "What the plants really prefer is a condition where plenty of rich food is present for the roots. I once knew a disused gravel hole planted with these things. In this, old potting soil and refuse had accumulated to the depth of two feet. The success of these plants while they remained, during six years or more, was phenomenal. For many years these plants were a complete success with me, in a soil that in hot and dry summers became dust-dry to a considerable depth. This success I attributed to the very liberal way in which the soil was manured. Cow manure was that employed, and the cooling nature of it suited the plant exactly." With Mr G. F. Wilson at Wisley this Iris used to grow well almost anywhere. Mr Dixon, of Astle Hall, Cheford, records that with him the best he has are growing in water 1 to 1½ ft. deep, but that the plants must be well established before planting to this depth. The water rat he finds

a deadly enemy. Planting is best done in spring, say in April, but certainly not in autumn. Division is not a satisfactory method of increase, but good results may be got from imported clumps. Seedlings are raised easily, and flower the third year. If the seeds can be sown where the plants are to remain, that plan should be tried, as it often leads to greater success than is possible in any other way. A sowing should also be made in pans or boxes, the seedlings being pricked out in beds or in other pans or boxes with as little injury as possible to the roots. Much depends on circumstances, but the advantage of a frame for the early stages is likely to be considerable. In the Cambridge Botanic Garden, where the plant cannot succeed well, owing to lime in the soil and water, I have had fine flowers by planting in the bog garden on mounds above the water, but the plants invariably die after two or three years. I keep and flower the plant in sunk tubs, artificially watered, but here the roots are too restricted, and development is limited. Nicholson says in his Dictionary that it succeeds admirably when cultivated in pans, standing in about two inches of water. I have never known injury from frost, but a Continental writer recommends protection with dry leaves or litter during severe weather.

C.—ONCOCYCLUS IRISES.

No one has had greater success in growing these Irises than Sir Michael Foster, and his prescription, summed up in a few words, is simply this—cover with glass as soon as flowers are over and keep dry until autumn; then as soon as growth commences expose to weather. Proper soil and drainage must of course be understood. Good drainage is essential, and the next necessity is a good depth of gritty, loamy soil, in good heart, but without manure. Roadside scrapings have

entered largely into the composition of the best borders known to me. It is needless to say that a sheltered position open to the full sun is indispensable, and if the border backs against something solid in the shape of a wall, so much the better. The cultivation of these Irises must always be more or less experimental, for no one has ever yet attained absolute success and command over them. They are, however, well worth all the trouble that can be bestowed upon them.

Regarding the Palestine *Oncocyclus* Irises, Sir Michael Foster writes in *The Gardeners' Chronicle* of 1892 as follows:—I have come to the conclusion that all these should be treated in this country by the "taking-up" method—at least until they have become acclimatised, if ever they do. But one or two points appear to be essential for success by this method. In the first place they should be planted quite late—say in October or even November, according to climate; this prevents their making any growth of leaves before winter comes on. In the second place they must be protected during winter and early spring, so that the young shoots receive no injury from frost. As soon as the foliage, after flowering, begins to die down, they should be taken up, well ripened in a sunny greenhouse, and kept absolutely dry until it is time to plant them again. The object of this treatment is to secure their not making any very active growth until fairly warm weather sets in, so that when they are hardest at work they may be comforted by genial sunshine and not buffeted by autumn rains and winter frost as they are when they are left in the ground or planted in early autumn.

Elsewhere, in the same year of the *Chronicle*, Sir Michael Foster, responding to a letter from Mr Van Tubergen, explains his position. He says: "It is undoubtedly a barbarous method—*i.e.* that of the last

paragraph—and should only be resorted to under compulsion; but it seems to me necessary for these special Palestine *Oncocyclus* Irises until at least they have been acclimatised. . . . Each of us must act according to our climate and conditions, checking and correcting our scientific deductions by careful experiences; and this, I take it, is the true art of gardening. The other *Oncocyclus* Irises with me, for the most part, make very little growth in autumn after the first spurt, which follows the late September rains, and I can much more safely leave them in the ground, for remaining in the ground is undoubtedly the most natural condition, and it is with great reluctance that I am driven to interference.”

Mr John Hoog (C. G. Van Tubergen, jun., of Haarlem) has done an immense service by importing soil and getting it analysed. The result is given in his article in the *Journal of the Royal Horticultural Society*, vol. xxvi. (1901) p. 324, “On some experiments in the cultivation of *Oncocyclus* Irises.” He also had the soil of his own garden analysed, and the results of the analyses are as follows:—

Native Soil.			Dutch Bulb-Garden Soil.
Sulphuric Acid (S.O_3)	.	0.087	0.0812
Chlorine	.	0.034	0.021
Phosphoric Acid (P_2O_5)	.	0.044	0.656
Lime (CaO)	.	155.800	1.840
Magnesia (MgO)	.	49.560	0.516
Oxide of Iron (Fe_2O_3)	.	30.780	5.240
Kali (K_2O)	.	0.198	0.206
Natron (Na_2O)	.	0.050	0.054
Alum (Al_2O_3)	.	7.581	traces

Differences are here extreme and no greater could perhaps be met with, but nevertheless some success has been claimed, even in Holland, with soil as above indicated. Mr Hoog in his article remarks that he would have added dolomitic limestone finely ground to his soil, had it been possible to get it, since it contains a high percentage of both lime and magnesia. Failing this, he tried a sample of marl, for lime, selected because of its only very feeble phosphoric acid, and to provide the magnesia he used Grecian Magnesite, which was easily obtainable. For experimenting with, ten beds were made, each eight yards long by one wide. The *Oncocyli* were planted in December 1899, and at the same time the first bed had a dose of 11 lbs. of marl with $4\frac{1}{2}$ lbs. of magnesite, strewn between and over the Iris rhizomes. This quantity was increased in the remaining beds, so that, to the last, a maximum dose of nearly 66 lbs. of marl was given, with $31\frac{1}{2}$ lbs. of magnesite.

"It soon became evident that there was a marked difference between the formation of new roots emitted by the rhizomes planted in the prepared beds and those planted in our ordinary soil. In the latter case roots were forming slowly and sparingly, whereas on the marl and magnesite many more new roots were developing which also grew much faster. The difference in leaf growth in the spring also became most strongly marked, and I never saw finer and healthier specimens of *Oncocyli* than my treated plants became in the course of the spring and summer of 1901."

The experiments also showed that in my Haarlem soil (moist, well enriched sand) there was no difference in the growth by plants in beds to which the maximum dose (66 lbs. of marl and $31\frac{1}{2}$ lbs. of magnesite) had been added, from those on the bed with about 44 lbs. of marl and $19\frac{1}{2}$ lbs. of magnesite; but there was a marked difference in the luxuriant growth of the Irises on the

beds with the maximum dose and on the first bed, which contained only 11 lbs. of marl and $5\frac{1}{2}$ lbs. of magnesite. Lime is the great thing, magnesia is not so much wanted.

Mr Hoog continues to say that when the rhizomes were lifted in July they were found to correspond with the fine leaf growth the plants had made. Some cultivators in this country, including the late Rev. H. Ewbank, have strongly objected to lifting the rhizomes, but here Mr Hoog gives his reason for doing it in Holland. "On our ever-moist Dutch soil I had found it necessary to take up the rhizomes of the *Oncocyclus* Irises every year after the growth is finished in July, for if we do not do so the moist sub-soil causes the rhizomes to start growing again at once, so that when winter sets in the plants have tender young shoots, from three to four inches long, and these inevitably fall a prey to frost, or get damped off if the winter is moist and misty." Formerly Mr Hoog advocated late planting, but now he finds it better to plant when the roots taken up in July have had five weeks' rest. He remarks that the *Oncocyclus* left for trial in the ground of the marl and magnesite-treated beds did not suffer and came through the winter splendidly.

Mr R. Wallace, of Messrs R. Wallace & Co., gives me their particular points in the culture of *Oncocyclus* Irises as follows:—With us they require lights put over the bed very soon after flowering, and then, later on, we lift them and cover with dry soil and store in a dry shed, planting about November. If we leave them in the ground they start too early into growth.

Messrs P. Barr & Son give their views in the following words:—These (Irises of the *Oncocyclus* and *Regelia* sections) are best planted in December if the roots can be kept in good condition and from growing until that time. They should be stored in a cool and dry place. Plant so that the tops are not more than

1½ in. below the surface in a light, loamy, but *thoroughly well drained soil*, into which plenty of bone meal has been worked (5 lbs. to the square yard); cover with three or four inches of wheat straw, or better still, with marsh reeds, or cut heather, which remove in March. Immediately the plants have done flowering place over them a light, or panes of glass elevated eighteen inches above the ground, so as to admit at the sides a free entry of air, and at the same time to keep off rain till October. The object desired is to thoroughly ripen the roots, and to prevent their starting into growth too early. The covering in winter is to keep off heavy rains and to discourage a premature growth. The Onco-cyclis Irises like to remain undisturbed for years; they may, however, be lifted four or five weeks after flowering and stored on a dry, sunny shelf, in perfectly dry sand, till December.

Mr Amos Perry, whose experience goes back for many years, says of these Irises that there are no two alike in their requirements. He thinks the borders in front of the Cambridge houses, facing south, an ideal position, and certainly some fine flowers have been produced there. He would plant on slightly raised ground and protect during inclement weather in early spring.

Sir Michael Foster has somewhere written that as these plants produce seed so freely in a state of nature, he infers their frequent reproduction from seed. They are naturally short-lived plants, very probably, and herein, with the suggestion of raising from seed, there is perhaps a valuable hint. At present these plants are almost exclusively grown from imported rhizomes, and I may point out that to the great majority of growers it makes a very great difference whether they are of good, strong quality, or the reverse. Mr Hoog finds that raising from seed is slow but sure.

D.—GENERAL REMARKS ON CULTIVATION.

There is no royal road to the art of gardening, and it is difficult to give general instructions. Irises vary in their requirements, and under each species it has been endeavoured, in Part II., to give the hints that are necessary. Those who wish to grow Irises must make the attempt—those mentioned at the end of Chapter II. are all easy of cultivation—and by so doing more is likely to be learnt than by any amount of abstract reasoning about it. Much guidance may be obtained from reading, but observation in one's own garden is absolutely essential. The highest art in gardening is to know almost by instinct what a plant is likely to require, but this comes only by long familiarity, and partly, no doubt, by natural aptitude. We must know as much as possible of natural conditions, and this helps very much; but the accomplished gardener is often able to go further, and he sometimes provides his plants with better conditions than ever they knew in nature. The explanation is simple, viz., that in feral nature there is ever a struggle for existence, and the gardener is sometimes able to interpose a shield, behind which the plants flourish as they never could before. Sometimes, however, plants are so inured to the hardship of the struggle that they cannot do without it. Their very structure has been altered, and the structure suits no other condition. Here we certainly get an idea for the study of the cultivation of Irises. If, indeed, we notice the structure, the habit, and the conformation of any Iris, we shall not be far wrong in our first experimental treatment of it. A bulbous Iris, we know very well, must have a dry season, and we know when that dry season ought to be, if we notice when the plant dies away and when it tries to grow, which it will do precisely according to its own almanac. This observation of season will help us much.

with a variety of kinds that are not bulbous. Dry, hard growth is usually indicative of dry conditions; of a sparse root system, especially if the roots are long, the same may be said, and no less also the peculiarity of a restricted growth above ground. Succulence and a soft, copious root system means that moisture is required.

If a principle of general application can be given, it is with regard to planting and replanting, viz., that the operation should be performed when growth is about to begin, never when it is proceeding vigorously, or when it is about to finish, or when the plant is dormant. Many kinds, especially of the German Iris or Pogoniris section, may be divided or replanted immediately after flowering. A good growth is then possible in preparation for the next flowering season. Here it may be said that old masses need dividing; soil gets exhausted and the plants may even form a ring with an unoccupied centre, a state of things which should never be reached.

Of propagation little requires to be said. It is almost always a question of division, and most Irises can be divided when they have grown to a sufficient extent. Many Irises divide readily, but very often discretion requires to be exercised, and this can only be done in the presence of the plant itself. The time of division must always be when growth is about to commence. Garden forms must always be increased in this way, but when original types are in question it is always of interest to raise from seeds, which should be sown, as a rule, as soon as ripe or immediately on being received. It has been remarked elsewhere that in the event of having a few seeds only, they should be sown in a pot in frame or greenhouse, while larger quantities may be sown either in the open ground, or in free ground under a frame or handlight. As a rule they germinate readily. Bulbous Irises should be taken up for division as soon as they go to rest, because later there is the danger that

it may be just too late to disturb them, while if attended to directly they die down no harm can be done. The bulbs may be kept dry for a time or they may be replanted according to the kind. Juno Irises, be it remembered, have thick and fleshy store roots, and these should be preserved as far as possible. No bulbs with this kind of root like disturbance.

CHAPTER V

HYBRIDS AND HYBRIDISING

IN the Apogon group few hybrids have been raised. The principal known to the author are Monspur and ochaurea (see accompanying plate), the former between *Monnieri* and *spuria*, and the latter between *orientalis* (*ochroleuca*) and *aurea*, both raised by Sir Michael Foster. They are good and desirable plants. No one has succeeded in combining *I. laevigata* with any other species, but further effort is worth making. The present writer has failed in trials with *I. Pseudacorus*, but some hybrids have been obtained only by repeated experiment, and it would be impossible to say that such a probably valuable cross could not be effected. Those who wish to experiment in hybridising may find suggestion by glancing through the keys to this and to other sections herein provided. For instance, *I. albopurpurea* and *I. hexagona*, *I. fulva*, and *I. laevigata* coming near together invite attention, especially the first pair.

In *Evansia* no cross appears to have been effected, but the first three species are not undeserving of attention.

In *Oncocyclus*, combined with other groups, and especially with *I. Korolkowi*, of the Regelia group, wonders have been performed by Sir Michael Foster, and for some years I have noted these *Korolkowi* hybrids in his garden as among the most beautiful of flowers I know. His *paradoxa* $\times$ *Korolkowi* is exceedingly rich and beautiful. These groups are closely allied, and, by crossing, magnificent flowers have been obtained, not singly on



IRIS OCHAUREA

the stem as in *Oncocyclus*, but two together as in *Regelia*. They have also had the advantage of being much more easily grown than the *Oncocyclus* Irises.

Mr C. G. Van Tubergen has recently made similar crosses, and as he has kindly sent me cut flowers, I give below a few descriptions. The way these flowers were sent is interesting. Unopened buds were tied with raffia to prevent expansion on the journey, and a number of stems with flowers could thus be packed in a comparatively small box. Immediately on being untied the buds began to open, and in a marvellously short time were transformed into perfect flowers.

Korolkowi violacea × *Surwarowi*.

— (type) × *Oncocyclus*.

These are remarkably similar, considering that the male parents are quite distinct. Both have blue-purple standards differing slightly in shade of colour; the falls of the first are deep plum purple with veins of the same colour on reddish yellow ground, and those of the latter are brown with veins of the same colour on dull pale yellow ground.

Korolkowi violacea × *Oncocyclus* seedling.—The flower of this is very fine and its twin flowers alone suggest that it is not a pure *Oncocyclus*. Its colour effect is that of rich purple, neither red nor blue predominating. The falls are $2\frac{1}{2}$ in. by $1\frac{3}{4}$ in., closely veined on a pale tint of the same colour, the beard strong and broad, with a very deep purple signal in front. The standards are about 4 in. long by nearly $2\frac{1}{4}$ in. broad, the style arms deep purple with crests veined like the falls.

Korolkowi (type) × *susiana*.—There is not much evidence of *susiana* in this; it reminds one rather of the cross with *iberica*. The venation of both falls and standards is clear and bold. In the first the veins are strong, of deep plum colour on a pale yellow ground, the "signal" long and of the same colour as the veins. The standards are

finely veined with lilac purple on a white ground tinged with the same colour. The style arms are reddish brown, the crests veined on the same ground colour as that of the falls.

Korolkowi violacea × *Mariae*.—The lilac standards form the feature of this flower. On a lilac purple ground the veins are finely traced and of dark lilac, and there are innumerable dots between them. The falls are conspicuously veined with plum purple on a nearly white ground. Here the veins are broad and strong. The "signal" is of deep plum-colour, the beard is also plum-coloured and diffuse.

Korolkowi venosa × *atropurpurea*.—The note of this flower lies in its coppery purple colour. The falls are reddish purple, with veins proceeding from the signal, which, near the margin, are of a yellowish white ground. The standards are of deep, coppery, plum purple. The "signal" spot is deep plum purple, merging into the colour surrounding it. The beard is linear, of stout hairs thinly planted.

Korolkowi concolor × *iberica*.—The male parent is less impressed upon this plant than the female parent. It has falls of reddish plum purple, self in the middle area, but running out into veins, on a yellowish white ground, towards the margins. The standards are of deep lilac purple, veined, but with the ground colour nearly as dark as the veins, so that they are not conspicuous. The beard is linear, of thinly planted dark purple hairs. The style arms and crests are brown-red purple.

Korolkowi (type) × *iberica* var. *Van Houttei*.—This is striking on account of its clear venation. The falls are veined with plum colour on a yellowish white ground, the standards with violet-purple on nearly a white ground. The "signal" is conspicuous, due to confluence of the veins, and the beard is distinct and black. The flower is of considerable size, measuring $3\frac{1}{2}$ in. by



IRIS KOROLKOWI ONCOCYLUS

2½ in. The style arms are deep-red brown, and the crests of brighter claret purple clearly veined.

I. paradoxa has been exceedingly useful in the hands of Sir Michael Foster, and it is always evident in the hybrid of which it is a parent. With such plants as *I. variegata* and *I. sambucina* it has produced very easy-growing and effective plants. *I. iberica* has also proved a very good parent. Notwithstanding the magnificent and superb results obtained by crossing with members of the Oncocyclus and Regelia groups, it is still perhaps by the use of the best of these groups that finest results may be expected. I am not aware that the magnificent *I. Gatesi* has been utilised, and there is also the much lauded *I. sofarana*. Of the Regelia group *I. Korolkowi* is a splendid parent, and some of its beautiful features are always impressed upon the offspring. It is at least curious that Oncocyclus Irises should unite with members of the Pogoniris group, and less than a prophet might promise revelations of beauty and utility if successful crosses are made. A present example, raised by Sir Michael Foster, may be given in *iberica* × *pallida*. The beard is quite that of the Oncocyclus section, but the plant is 2½ ft. high, the stems are one to three flowered, and the habit of the plant is strong and robust. It has spathe-valves, which, being scarious, distinctly point to *pallida* as one of the parents. *I. iberica* is not so clearly seen, but the "eye" or "signal" spot of *iberica* is a great feature of the plant. It is distinctly ornamental, and has the advantage of being easily grown. Its foliage is retained in winter, and growth also appears to be made.

Within the Pogoniris group numerous hybrids have long been familiar in gardens, and some, perhaps unfortunately, have been named as if they were wild types. Such, for instance, are *I. neglecta*, *I. hybrida*, *I. plicata*, and *I. Swerti*. Wild plants no doubt are

often of hybrid origin, but it is useful to distinguish garden hybrids as such, and it is no more than right to record parentage. It should be indicated, if possible, in the name, as in the case of *I. "Monspur"*—between *I. Monnieri* and *I. spuria*. The so-called "German Irises" belong to this group, and the term often includes a number of forms which have nothing to do with *I. germanica* proper. Sir Michael Foster has shown from his experiments in hybridising and upon other considerations that they are all hybrids or sports of three species, viz., *I. pallida*, *I. sambucina*, and *I. variegata*. The beautiful Iris known as "Queen of May" is *I. pallida*, with the smallest possible infusion of the blood of *I. sambucina*. "Madame Chereau," again, is a seedling of *I. sambucina* crossed with *I. pallida*. Out of one cross between a not quite pure *I. variegata*—a *variegata* which contained some blood of *I. sambucina*, Sir Michael Foster raised a large number of plants, among which he could recognise not only typical *neglecta*, but a very large number of the German Irises of the nurseries.

To this section belong the new hybrids raised by Mr W. J. Caparne of Rohais, Guernsey. He has three sets, apparently, and terms them "Early Alpine," "Intermediate," and "Tall Summer-flowering" respectively. Parentage, unfortunately, is not given, but of the "Early Alpine" he says that they have been "evolved and developed from nearly every early-flowering species obtainable during the last twenty years." *I. olbiensis*, *I. Chamaeiris*, perhaps *Cengialti*, and certainly *I. kashmiriana* may be detected in some of these hybrids; but whatever their parents may be, they are themselves no doubt very charming and attractive. I have a note that *I. pumila* and *I. florentina* are among the parents. The raiser claims that they provide a flowering season of from six to nine months' duration. An



IRIS PLICATA "MADAME CHEREAU"



account, with plate, is given in *The Gardeners' Chronicle* of Nov. 30, 1901, p. 397.

For future work the re-introduction of *I. chrysantha* is much to be desired. Its narrow leaves and large bright yellow flowers make it a very desirable parent to cross with plants having other marked features. Meanwhile, perhaps, the *Pumila* group is worth attention, with the object, for instance, of retaining dwarf habit while increasing the size of the flower.

Some interesting hybrids have been raised in the *Xiphion* section, and the fine Iris "Thunderbolt" is sufficient to suggest experiment. Its origin is not recorded, but it is almost undoubtedly a hybrid, and is suggestive of things that might be. *I. byerensis*, a peculiar-looking plant, is said to be a hybrid between an *Apogon* and a *Xiphion*, but more information is required. *I. Histrio* and *I. Bakeriana* are perhaps worth attention.

In the *Juno* section Mr C. G. Van Tubergen has raised the interesting hybrid *sindjarensis* $\times$ *persica*. This is said to be charming, and no doubt there are great possibilities in working with allied parents. One of the most gaily painted of all Irises is *I. Rosenbachiana*, and I am not aware that any cross has been made with it. The new Irises, *Tauri* and *stenophylla*, almost promise good results, if crossed judiciously.

Upon the manipulation of flowers, when it is desired to effect a cross, very little need be said. Certain precautions are regarded as necessary, and the chief consideration usually concerns the flower that is to produce the seed. Before any pollen can have fallen the anthers must be removed; and this is easily done in Iris, sometimes, by gently unfolding the bud when sufficiently advanced, then picking out the anthers with small forceps. In any case there is no difficulty, and slight

mutilation does no harm. The best way is to try a few buds experimentally, and the easiest method of procedure is sure to suggest itself. When the anthers have been removed the bud must be covered with muslin, to prevent the access of insects with possibly pre-potent pollen. No sewing is necessary. The best way is to take a nearly square piece of muslin, gather in one side and lap the edge over to make a kind of extinguisher, tying the top once or twice round with raffia. Carefully place this over the flower and tie in round the bottom. Then when the stigmas are likely to be ready (which may often be known by similar flowers that have not been tied up), apply the pollen, tie on a label, and replace the extinguisher. If the cross is of scientific importance it may be well, in view of unbelievers in the result, to keep the pollen-bearing flower carefully covered with muslin. In *Iris*, with ordinary care, results may be made absolutely reliable. The flowers are dependent upon insects, and good crosses might often be effected by conveying pollen on the finger-nail, or by carrying the anther itself to the stigma, and without taking precaution of any kind; but this would be unscientific, and results could not be depended upon. The instruments really required for general work in crossing are very few, and the amateur may be helped by the information that the greater part of all the plant crossing that is done, is done with very simple means, the orthodox camel-hair brush being usually dispensed with. It is so easy to carry the anther or stamen itself between forceps, and this method is really much more gentle than the use of a brush. I find in my box a pair of fine-pointed scissors, a pair of small forceps, labels of stiff paper $1\frac{1}{2}$ in. by $\frac{7}{8}$ in., and a few pins, which are useful in closing gaps which may be left in putting on the muslin extinguisher. A notebook must of course be used. To advise the use of brains is

like trying to make a joke, but it may be remarked that patience and perseverance are essential if much good is to be done.

In this chapter on hybrids and hybridising it may be important to point out that everything is not got by crossing. Plants naturally vary from seed without crossing, and valuable results may often be obtained by sowing from a selected parent or parents. Some of the progeny may be better and some worse, and if one of several thousands happens to make any definite advance in beauty it may be well worth all the trouble that has been taken. Some kinds of Iris, and other plants too, could not be improved by crossing, and it is much better to devote our energies to the improvement of the existing type. This, I think, might be said of *Iris Rosenbachiana*. By selecting best forms and raising from them, very valuable results could no doubt be obtained.

CHAPTER VI

DISEASE AND INSECTS

It may be said fortunately that Irises are usually free from both animal and vegetable attack. Insects are very rarely found, and ordinary kinds, if met with, could easily be dealt with by usual methods. There is, however, an "Iris Fly," which affects *I. orientalis* (better known as *I. ochroleuca*) and its allies, and, from the account given, the only way of dealing with it would be to destroy the leaves, though experience alone could determine whether this is necessary. It was described by the late Mr I. O. Westwood in the *Gardeners' Chronicle* of April 21st, 1888, p. 493, and a good figure accompanies the article. The insect was apparently new, for the generic name *Agromyza* is suggested provisionally, with the specific name *Iridis*. Comparison is made with the leaf-miner of the Marguerite, and in this case also the damage is done by the larvae which feed upon the soft internal tissue of the leaf, causing patches of lighter colour on both sides. It is satisfactory to know that in spite of position within the leaf, the larvae are attacked by a parasite, a beautiful little Pteromalid of golden green colour, with yellow legs. The larva of the *Agromyza*, upon which it preys, is about $\frac{1}{8}$ of an inch long, and the fly is black, about an eighth of an inch long, with a wing expansion of a quarter of an inch. The wings are hyaline, finely veined with black, of yellowish tinge towards their base. It may be possible to destroy the larvae by squeezing them with finger and thumb while in the leaf.

FUNGOID DISEASES.

Iris Rust.—The only vegetable parasite which has much obtruded itself upon the notice of the author is a rust, *Uredo Iridis*, Thumb., and this is liable to be a very serious pest of the *Oncocyclus* section. It is most unsightly, and though it does not kill the plants, it keeps them in a more or less weak condition. It is easily recognised, and if once introduced the only efficient thing to be done, apparently, is to destroy the plants. The pustules are described by Dr M. C. Cooke as linear-ovate and sometimes confluent. They grow on both surfaces, are covered at first by cuticle, and when exposed, by its rupture, appear of a chestnut brown colour. It is a British species and occurs sometimes on *Iris foetidissima* but also occasionally on *I. Pseudacorus*. It may not be uninteresting to point out that this fungus is of the same genus as the "Rust" of wheat (*Uredo linearis*), which is but one stage in a marvellous cycle of changes. The yellow "Rust" of June and July becomes the purple brown or almost black "Mildew" of autumn (*Puccinia graminis*) and spores,¹ from this stage produce the "Cluster-cups" (*Aecidium Berberidis*) on the leaves of Barberry, from which again arises the *Uredo* form on wheat. The point here to be noted, however, is that, according to Dr Cooke, *Uredo Iridis* is supposed to be without the *Puccinia* and *Aecidium* stages. The *Uredo Iridis* is British, but it appears not unlikely that gardens are troubled by an importation which is more virulent than the native stock.

Iris Bulb Scab.—The next pest of consequence, and the more serious in the fact that it may kill the plant, is this Scab, caused by *Mystrosporium adustum*, Mass. It affects *Iris reticulata*, and complaints of its ravages have appeared in the gardening journals. An

¹ A spore is the analogue of a seed in flowering plants.

account of it is given by Dr M. C. Cooke in the *Journal of the Royal Horticultural Society*, vol. xxvii. p. 398, and in plate v. it is represented by figure 92. It is described as a black mould which forms crust-like patches on the outer sheath of the bulb, gradually spreading to every part. Dr Cooke says that, "Soaking the bulbs for two hours in a solution of one part formalin to three hundred parts of water will destroy the fungus, so long as it is external, and has not penetrated deeply into the bulb." If this has happened, no doubt the bulbs should be burnt, and a new stock obtained for planting in a new position. The original description of this fungus is by Mr Geo. Massee in the *Gardeners' Chronicle* of June 14th, 1899, p. 412, where it is also well illustrated.

Iris Leaf-blotch, caused by *Heterosporium gracile*.—This disease is described by Dr Cooke with the last, in the *Journal of the Royal Horticultural Society*, vol. xxvii. p. 398, and also in vol. xxvi. p. 450. In the volume first quoted, on plate v., it is represented by figure 90. Dr Cooke says that for some time past the foliage of *Iris germanica* has been suffering in many places from this mould, which appears at some seasons with astonishing vigour, ultimately destroying the plants. The leaves become spotted with elliptical or oblong fuscous spots about a quarter of an inch in length, a little darker at the edge. At length these spots become confluent, until the whole surface of the leaf is brown and dead, whilst the original fuscous spots remain of a paler colour than the surrounding tissue. Often there is no external evidence of the presence of any parasitic mould upon the spots, especially on the spots occurring in the spring, but there is a plentiful fungoid mycelium in the tissues. Ultimately some of the spots, towards the centre, are dotted with little black dots, like pin-points, which represent the mature condition of the black mould

which is the source of the mischief. The same fungus has been found also on *Freesia*, *Antholyza*, and *Hemerocallis*. It is recorded from Britain, France, Italy, and Germany, and is known also from New Zealand, the Cape of Good Hope, and North America. The first notice for Britain is by Dr Cooke in the *Gardeners' Chronicle* of June 9th, 1894. Another species is very destructive to Pinks and Carnations, while a third has been found upon the leaves of the Auricula. Dr Cooke suggests that, if not too firmly established, the disease may be overcome by spraying with ammoniacal copper carbonate solution. It consists of water 16 gallons, carbonate of copper 1 ounce, carbonate of ammonia 5 ounces. "Mix the carbonate of copper and the carbonate of ammonia, and dissolve in about a quart of hot water; when dissolved add 16 gallons of cold water." This no doubt may be regarded as a good receipt for other fungoid pests. It must be remembered that no outward application can affect the mycelium within the tissues, unless the leaves are also killed, the object being always to kill the spores, which appear as very fine dust, and perpetuate the fungus.

Iris Brand.—This I note only from Dr Cooke's article in the *Journal of the Royal Horticultural Society*, vol. xxvii. It is caused by *Puccinia Iridis*, D.C., and is represented in plate v., fig. 91. It is found on the leaves of many species of Iris, besides *I. foetidissima* and *I. germanica*. Dr Cooke believes that this is the fungus called by Berkeley *P. truncata*. He says, "The uredospores¹ are found in crowded pustules, at first covered, then exposed, of a rusty brown colour, crowded together, and either subglobose, elliptical, or ovoid, externally rough and ochraceous. The teleutospores¹

¹The uredospore is produced in summer, and reproduces the same form of the fungus; the teleutospore is produced later, remains dormant during the winter, and in spring produces a distinct form of the same fungus.

occur in linear, elongated, striaeform pustules which are blackish to the eye." Presumably the state producing teleutospores is later than the state producing the uredospores. This pest is known in France, the Ardennes, Germany, Switzerland, Italy, and Siberia. The Cluster-cup form is unknown. No experience in dealing with this disease appears to be recorded.

Cluster-cups(*Aecidium Iridis*).—This fungus is known in North America, on leaves of *Iris versicolor*, but is not apparently recorded as a pest for Britain.

It will be noticed that I have frequently referred to Dr Cooke's article in the *Journal of the Royal Horticultural Society*. It is entitled "Pests of the Flower Garden," and is exceedingly valuable as an account of the parasitic *fungi* causing disease in gardens. At the end is a valuable account of fungicides. Jeyes' Fluid is recommended for sterilising soil, and meritorious effects are stated for paraffin and potassium permanganate, both of which may be used without risk to the operator. For paraffin the proportion is one wine-glassful to two gallons of water. The present writer has found that the mixture is very easily made with a syringe if the paraffin is first of all saturated with naphthaline. Potassium permanganate is obtainable from all chemists in crystal form, and the solution should be of the strength to give a pale rose colour. Sulphate of iron is a useful fungicide, and may be used in the proportion of two pounds of sulphate to five gallons of water. The iron may be valuable as a manure, but it is worth note that too much in the soil is distinctly injurious.

PART II

CLASSIFICATION AND DESCRIPTION WITH NOTES ON SPECIAL CULTURE

KEY TO SECTIONS

I. ROOTSTOCK A RHIZOME.

- A. Falls without crest or beard.

Section **Apogon**, p. 58.

Ex. *I. unguicularis*, *I.*
sibirica.

- B. Falls with pubescence in the
place of beard, leaves green
as in *I. japonica*, with marked
difference between an upper
and a lower surface.

Section **Pardanthopsis**, p. 87.

One species, *I. verna*.

- C. Falls with a distinct crest on
lower part of blade and
down the claw, no beard.

Section **Evansia**, p. 89.

Ex. *I. japonica*, *I. tectorum*.

- D. Falls with a rudimentary
crest from which springs a
beard.

Section **Pseudevansia**, p. 95.

Ex. *I. Kingiana*.

CHAPTER VII

Apogon.

(Beardless Irises with rhizomatous rootstock.)

I. LEAVES LINEAR.

- Stemless, or with stem hardly exceeding 3 inches.
 - Tube 5 to 6 in. long, leaves $\frac{1}{4}$ to $\frac{1}{2}$ in. broad . . . 1. *I. UNGUICULARIS*
 - Tube 3 to 4 in. long, leaves $\frac{1}{4}$ to $\frac{1}{2}$ in. broad . . . 2. *I. CRETENSIS*
 - Tube $1\frac{1}{2}$ to 2 in. long, falls with nearly round blade 3. *I. HUMILIS*
 - Tube $\frac{1}{2}$ in. long, falls with oblong blade, violet-scented . . . 4. *I. RUTHENICA*
- ** Stem 3 to 6 in. long.
 - Tube $1\frac{1}{2}$ to 3 in. long, limb lilac or purple . . . 5. *I. MACROSIPHON*
 - Tube $\frac{1}{2}$ to $\frac{3}{4}$ in. long, limb pale yellow . . . 6. *I. HARTWEGI*
- *** Stem 6 to 12 in. long.
 - † Perianth-tube cylindrical.
 - Tube $\frac{1}{2}$ in. long, flowers yellow . . . 7. *I. GRANT-DUFFII*
 - Tube $\frac{1}{2}$ to $\frac{3}{4}$ in. long, flowers not yellow, usually lilac 8. *I. DOUGLASSIANA*
 - †† Perianth-tube short and curved.

Crests narrow obtuse, leaves
 $\frac{1}{2}$ to 1 ft. long, $\frac{1}{8}$ in. broad
 or less, capsule trigonous

9. I. TENAX

Crests deltoid, leaves 1 to $1\frac{1}{2}$
 ft. long, $\frac{1}{4}$ in. broad or
 more, capsule six-ribbed
 and beaked, stem com-
 pressed

10. I. ENSATA

**** Stem 2 in. to a foot long
 with several brownish short
 sheathing bracts.

Perianth-tube, nearly obsolete 11. I. BRACTEATA

Perianth-tube $\frac{3}{8}$ in. long . 12. I. PURDYI

***** Stem 1 to 2 ft. high or more.

† Stem hollow.

Perianth-tube almost obso-
 lete; falls much veined,
 blade orbicular; fruit ob-
 tusely trigonous 13. I. SIBIRICA

Perianth-tube $\frac{1}{2}$ in. long;
 falls not veined, blade
 oblong, lower half with
 tortuous white streaks;
 fruit sharply angled . 14. I. DELAVAYI

†† Stem solid.

Limb $1\frac{1}{2}$ to 2 in. long, stand-
 ards $\frac{1}{3}$ to $\frac{1}{2}$ in. broad, falls
 $\frac{3}{4}$ to 1 in. broad, leaves not
 splitting into coarse fibres 15. I. MISSOURIENSIS

Standards $\frac{1}{8}$ in. broad, falls
 $\frac{1}{2}$ in. broad, limb $1\frac{1}{2}$ to 2
 in. long 16. I. PRISMATICA

Standards $\frac{1}{4}$ to $\frac{3}{8}$ in. broad,
 falls $\frac{1}{2}$ in. broad near tip,
 stem sharply two-angled,
 pedicel $1\frac{1}{4}$ in. long . 17. I. GRAMINEA

Standards $\frac{1}{4}$ in. broad, falls
 1 in. or more broad, limb
 $2\frac{1}{2}$ to 3 in. long, sheaths
 splitting into coarse fibres 18. *I. LONGIPETALA*
 Standards minute $\frac{1}{4}$ in. long,
 falls 1 in. broad . . . 19. *I. TRIPETALA*

II. LEAVES SWORD-SHAPED.

(Except in *I. spuria*.)

- * Stem only 3 to 4 in. long—the
 only dwarf species in this set 20. *I. MACULATA*
- ** Stem tall.
 - † Standards distinctly small.
 - § Flowers lilac.
 - Leaves glaucescent . . . 21. *I. HOOKERI*
 - Leaves green . . . 22. *I. SETOSA*
 - §§ Flowers yellow . . . 23. *I. PSEUDACORUS*
 - „ white . . . 24. *I. TENUIS*
 - †† Standards large, capsule not
 beaked.
 - § Falls spreading in the ex-
 panded flower.
 Colour fulvous brown simi-
 lar to that of *Hemero-*
cillis fulva . . . 25. *I. FULVA*
 - Colour white to deep purple 26. *I. LAEVIGATA*
 - §§ Falls recurved in the ex-
 panded flower.
 Perianth-tube very short.
 Falls obovate - cuneate,
 claret purple . . . 27. *I. VERSICOLOR*
 - Falls with suborbicular
 blade, lilac . . . *var. VIRGINICA*
 - Perianth-tube $\frac{1}{2}$ in. long,

- ovary not grooved, flower
purple white-spotted . 28. *I. ALBOPURPUREA*
- Perianth-tube $\frac{1}{2}$ in. long,
ovary grooved, flower
lilac or white, not spotted 29. *I. HEXAGONA*
- Perianth - tube funnel-
shaped, $\frac{1}{2}$ in. long, bruised
leaves strongly malodor-
ous 30. *I. FOETIDISSIMA*
- ††† Standards large, capsule
beaked, six-ribbed, perianth-
tube short.
- § Stem and leaves hardly ex-
ceeding $1\frac{1}{2}$ ft., the latter
narrow, sword - shaped
and blue-green.
- Flowers lilac or purple . 31. *I. SPURIA*
- Flowers yellow or yellowish 32. *I. GULDENSTAE-*
[DIANA]
- §§ Stem 2 to 3 ft. or more,
leaves broad, of deep rich
green.
- a. Flowers full yellow.
- Falls with oblong blade,
standards under $\frac{1}{2}$ in.
broad 33. *I. AUREA*
- Falls with round blade,
standards 1 in. broad 34. *I. MONNIERI*
- b. Flowers white and yellow,
falls with obovate blade,
the central area yellow,
standard and style arms
white 35. *I. ORIENTALIS*

I. LEAVES LINEAR.

1. *I. unguicularis*, Poir.; *I. stylosa*, Desf., Hook.
fil. in *Bot. Mag.*, t. 5773, *Gard. Chron.*, Feb. 11, 1899,

p. 85 (illust.), see accompanying plate. The standards of the later flowers are sometimes of peculiar shape as shown. They are normally oblong. A lovely winter flowering species with delightfully fragrant flowers of considerable size. The tube is no less than 5 or 6 in. long, the longest in the genus. The stem is very short, and, as in some allies as well as in some bulbous Irises, it is the tube alone which elevates the perianth above the ground. The leaves, among which the flowers shelter, are very persistent, $1\frac{1}{2}$ to 2 ft. long or more and $\frac{1}{4}$ to $\frac{5}{8}$ in. broad, of bright green colour. Typically the flowers are bright lilac and have an expansion of about 3 in.; the falls are obovate-cuneate an inch broad, keeled with yellow, and at the throat are streaked with lilac on a white ground; the standards are $\frac{3}{4}$ in. broad, narrowed suddenly into the claw. An unusual point of structure is found in the filaments which are sometimes united to the top. The style is solid with the tube proper, and this structure is usual, though in some species in different sections the style is free, but without affording, so far as I know, a character of much use in classification. There are several forms distinguished chiefly by colour. There are said to be two white varieties and one of them is illustrated in *The Garden*, March 28, 1896, p. 236. Other forms are the following:—

Feathered white on falls and to less extent

on standards, leaves 2 to 3 ft. long . **marginata**

Flowers large rich violet, deep purple on

blade of falls, leaves shorter than in

type, flowers well above . . . **speciosa**

Flowers deep rich purple, leaves similar

to those of type . . . **purpurea**

Flowers of delicate pale mauve, flowering

later than type, in April . . . **lilacea**

This is one of the most valuable of all Irises and its culture is easy. Plant at foot of south wall in sheltered



IRIS UNGICULARIS ALBA WITH ABNORMAL STANDARDS

position out of doors, or on border indoors, or grow in pots, a summer dry treatment is then easily managed. The flowering season is from the end of September to end of March and even in April. It flowers out of doors during mild weather all through the winter, is invaluable for cutting, and flowers should be taken in bud to open indoors. The native country is Algeria and there it appears to flower in January and February.

2. *I. cretensis*, Janka, Baker in *Bot. Mag.*, t. 6343. *I. stylosa* var. *angustifolia*, Boiss. This is a near ally of *I. unguicularis*, but the leaves are much narrower, 6 to 15 in. long, $\frac{1}{2}$ to $\frac{1}{4}$ in. broad. The Greek form, Sir Michael Foster says, is much nearer *unguicularis* than the Asia Minor plant and forms a connecting link between the two. The leaf-sheaths of this species do not split into fibres. The tube is 3 to 4 in. long; limb bright lilac purple, 2 to 3 in. long; falls with obovate blade, $\frac{3}{4}$ in. broad, veined with bright yellow and blue-purple on a white ground at the throat, shorter than the narrow claw; standards oblanceolate, erect, plain lilac, $\frac{1}{4}$ to $\frac{1}{2}$ in. broad. The style arms are $1\frac{1}{2}$ in. long, gradually narrowed into the claw; crests lanceolate. It is native of Greece, Crete, the Ionian Islands and Asia Minor, ascending to 5000 ft. This species is best perhaps treated like *I. unguicularis*. It is not nearly so ornamental.

3. *I. humilis*, M. Bieb. *Fl. Taur. Cauc.*, i. 33. The rhizome of this plant is described as wide creeping but a tuft in the Cambridge Botanic Garden does not suggest that character. The rudimentary leaves are fibrous and the leaves proper are from 6 in. to a foot in length and $\frac{1}{2}$ in. wide. This is the third of the stemless species, and as the perianth-tube is only about 2 in. long, the flowers appear low down among the foliage. The falls, with nearly round blades, have a long cuneate haft; the standards are oblanceolate, and

from $\frac{1}{4}$ to $\frac{1}{2}$ in. broad. The style arms are narrow, and the crests deltoid. Colour, bright lilac. Does well on an ordinary border or bed. Is native of the Caucasus and Georgia, and thence to Hungary and Transylvania.

4. *I. ruthenica*, Dryand. *Bot. Mag.*, t. 1123 and 1393. This is the last of the so-called stemless species known to be in cultivation. A short stem may develop, but in the Cambridge Botanic Garden, where there is a good mass, the stemless character is preserved. The rhizomes are slender; sheaths short, splitting into fibres; leaves thin, 3 to 12 in. long at flowering time, $\frac{1}{2}$ to $\frac{1}{2}$ in. broad. The perianth-tube is twice as long at the ovary; limb lilac, $1\frac{1}{4}$ to $1\frac{1}{2}$ in. long; falls with an oblong blade $\frac{1}{2}$ in. broad, rather shorter than the haft; standards as long, oblanceolate, $\frac{1}{4}$ in. broad. The style branches are an inch long and crests deltoid. The variety *uniflora* (*I. uniflora* of Pallas) has rather broader leaves and the perianth tube is very short. Native of North China, Mongolia, and Manchuria, through Siberia and Central Asia to Transylvania. This does perfectly well on the open bed, but does not flower apparently unless the position is sufficiently dry and sunny. In the Cambridge Botanic Garden it flowers every year. It is a pleasing plant and worth growing. The flowers have the perfume of violets. An illustration will be found in *The Garden*, Sept. 5, 1896, p. 187.

5. *I. macrosiphon*, Torrey. *Bot. Whipple* 144. (N.B.—The Iris illustrated under this name in *The Garden*, August 14, 1897, is *I. Purdyi* according to Mr Purdy himself.) This and the next, with stems 3 to 6 in. long, are Californian, the present differing from the next by its lilac flowers. The leaves are a foot long and $\frac{1}{2}$ in. broad, firm in texture, greenish and finely ribbed. The stem is slender and one-headed; bract-leaves large and linear; spotless one to two flowered; outer valves lanceolate, green, 2 to 3 in. long. The

pedicels are very short, perianth-tube slender, $1\frac{1}{2}$ to 3 in. long, limb bright lilac, 2 in. long; falls obovate-cuneate, $\frac{3}{4}$ in. broad; standards rather shorter, oblanceolate, erect. The style branches are an inch long, crests deltoid. Native of California and Oregon. A variety *flava* is referred to in *The Garden* of Sept. 5, 1896. No experience can here be given of the cultivation of a plant known to be true *I. macrosiphon*.

6. *I. Hartwegi*, Baker in *Gard. Chron.*, 1876, 323. The leaves are firm $\frac{1}{2}$ to 1 ft. long, $\frac{1}{8}$ to $\frac{1}{4}$ in. broad, finely veined. The stem is 6 in. long, one-headed with a single linear leaf low down; spathes one to two flowered; outer valves lanceolate and green, $1\frac{1}{2}$ to 2 in. long; pedicel produced, not, as in the last, very short. The perianth-tube is $\frac{1}{4}$ to $\frac{1}{2}$ in. long; limb pale yellow, $1\frac{1}{2}$ in. long; falls with an oblong blade, $\frac{1}{2}$ in. broad, shorter than the haft; standards as long, oblanceolate, $\frac{1}{8}$ in. broad. The style-arms are narrow $\frac{3}{4}$ in. broad; crests divergent, obtuse. Native of California, first gathered by Hartweg in 1848. For culture, see chapter on cultivation, "Californian Irises."

7. *I. Grant-Duffii*, Baker, *Handbook Iridaceae*, p. 7; *Bot. Mag.*, t. 7604. This very distinct new Iris was first collected by Mr B. T. Lowne, who gathered it on the banks of the river Kishou in 1864, and subsequently by Sir M. E. Grant-Duff, in the plain of Esdraelon. By the latter gentleman, the plant was introduced to cultivation and the plant was figured in the *Botanical Magazine* in 1898. It is regarded by Mr Baker as coming near to the North American species *I. tenax* and *I. Douglasiana*, but from both of these it is distinguished by its concolorous yellow flowers. The rhizome is very short; the base of stem is swollen and is surrounded by a dark brown scariose sheath which is remarkably truncated, or suddenly cut off sharp all round. The leaves are narrow, firm and erect, but falling over at the

top, $1\frac{1}{2}$ or 2 ft. long. The stem is much shorter than the leaves, unbranched and with one or two erect sheathing leaves. The spathe-valves are linear, green, and 3 to 4 in. long. The ovary, like the pedicel, is about an inch long, and is cylindrical and rostrate. The tube is very short; falls oblanceolate, oblong, 3 in. long, furnished with an orange keel, haft veined below the middle with lilac brown; standards rather shorter than the falls, erect, pale yellow, oblanceolate. The crests are lanceolate and pale yellow. This plant has grown and flowered for several years without difficulty in the Cambridge Botanic Garden, where it has been planted on a narrow south border, with a wall at the back. The leaves grow up strongly in November and have not been injured, though a very cold winter has not yet been experienced by the plant. It is a native of the West of Palestine. Collectors of the genus are alone likely to think much of this Iris.

A new ally of *I. Grant-Duffii* is *I. Aschersoni*, described as an interesting species from Cilicia, being collected near Adana, with yellow flowers, tinged with green, veined and blotched with purple. It grows $1\frac{1}{2}$ ft. high, and is very free flowering. It is effectively illustrated in the *Garden* of May 3, 1902, p. 288, and Sir Michael Foster, who writes an accompanying note, says that *I. Grant-Duffii* is very remarkable for the way in which each bud, shooting off from a woody root-stock, becomes wrapped round with coats, the bases of old leaves, composed of stiff bristles, so that the dormant bud has in autumn the aspect of a bud with bristling coats; and then, that *I. Aschersoni* has much the same features except that the coats are netted and flexible; in *I. Grant-Duffii* the bristles are so stiff and stout that they readily pierce the finger. The leaves of *I. Aschersoni* are much narrower than those of *I. Grant-Duffii*, almost linear. Sir Michael Foster observes that there are,

probably in Asia Minor and Syria, yet other plants of the same group. He mentions the possession of *I. Masiae*, sent by Herr Max Leichtlin, which closely resembles the above two but has deep purple flowers, and is really a handsome plant, though a shy bloomer and a "miffy doer," to use a gardening phrase.

8. *I. Douglasiana*, Herb.; Hook. fil., *Bot. Mag.*, t. 6083. *The Garden*, Oct. 3, 1896, plate 1086. This is a good and distinct Iris, but it has not readily submitted to cultivation. It has been described as among the most distinct and beautiful of the beardless Irises. The rootstock is short-creeping, sheath leaves rigid, not splitting into fibres. The leaves are 1 to 2 ft. long, $\frac{1}{4}$ to $\frac{1}{2}$ in. broad, tapering to a point and strongly ribbed. The stem is 6 to 12 in. long with a long and linear bract-leaf. The spathes are two or three flowered. pedicels long; outer valves lanceolate, green, 2 to 3 in. long. The perianth-tube is cylindrical, $\frac{1}{2}$ to $\frac{3}{4}$ in. long; limb $1\frac{1}{2}$ to 2 in. long; falls obovate-cuneate, $\frac{3}{4}$ to 1 in. broad, pale lilac with darker lilac veins; standards oblong-unguiculate, $\frac{1}{2}$ in. broad. The style branches are an inch long with large obtuse crests. In colour, the flower varies from pale yellow to dark lilac, but is always veined. *I. Beecheyana* is regarded as a variety but it is nearly stemless with a wide creeping root-stock, which at least suggests that it might stand alone. The Santa Cruz variety, Mr Baker says, has whitish falls with a yellow keel and claret-purple veins. The plate in *The Garden* nearly answers to this. A native of California. For culture, see chapter on cultivation, under Californian Irises.

9. *I. tenax*, Dougl. in *Bot. Reg.*, t. 1218; Hook. in *Bot. Mag.*, t. 3343; *The Garden*, June 18, 1898, plate 1175. This Iris has a very bright lilac flower, but has never, I think, attained popularity. The leaves form a dense tuft from short creeping rhizomes, and attain a

length of 1 ft. by $\frac{1}{2}$ in. broad; the sheaths are short, splitting into copious fibres. The stems are slender, one-headed, $\frac{1}{2}$ to 1 ft. long, with one to two leaves much reduced. The spathes are one-flowered, valves green and lanceolate, $1\frac{1}{2}$ to 2 in. long; pedicles produced. The perianth-tube is very short; limb bright lilac, 2 in. long; falls obovate-cuneate with a spreading blade as long as the claw; standards oblanceolate, nearly as long as the falls. The style arms are an inch long with narrow obtuse crests. The capsule is obtusely trigonous, an inch long. It is native of Fort Vancouver, British Columbia, and Oregon.

Mr Perry writes me that this Iris does well planted in sandy peat, the top covered with sphagnum kept very moist, and partially shaded.

10. *I. ensata*, Thunb. *Trans. Linn. Soc.*, ii. 328; Regel, *Gartenflora*, t. 1011. *I. biglumis*, Vahl; Sweet, *Brit. Fl. Garden*, ser. ii. t. 187; *I. oxypetala*, Bunge; *I. fragrans*, Lindl. *Bot. Reg.*, xxvi. t. 1; *I. longispatha*, Fisch. *Bot. Mag.*, t. 2528. This well-known plant is not one of great merit, but is often found in collections. The rhizome is stout and the leaves split up into fibres. The leaves are rigid, glaucescent and strongly veined, 1 to $1\frac{1}{2}$ ft. long, $\frac{1}{4}$ to $\frac{1}{2}$ in. broad. Stem 1 ft. long, one-headed. The spathes are 3 to 4 in. long, one to three flowered; valves lanceolate, green. The pedicles are long; perianth-tube scarcely any; limb lilac, about 2 in. long; falls with an oblong or obovate blade $\frac{1}{2}$ to $\frac{3}{4}$ in. broad, rather shorter than the haft; standards as long, oblanceolate, $\frac{1}{2}$ in. broad. The style branches are an inch long with large deltoid crests. The capsule is $1\frac{1}{2}$ to 2 in. long, six ribbed, narrowed to a distinct beak. Native of temperate Asia, from Japan, the Western Himalayas, and the Caucasus. The culture is easy on bed or border. *I. Smithii* from Kew in 1881 is but a slight form of this. *I. pabularia* is a name under which some-

times it passes. *I. biglumis*, Vahl, above quoted, is kept up in the Kew Herbaceous List as a variety; so also is *I. oxypetala*. The var. *Pallasi*, *Bot. Mag.*, t. 2331, is also included in that list.

11. *I. bracteata*, S. Wats. in *Proc. Amer. Acad.*, xx. 375. This is regarded by Mr Carrington Ley as the best of the yellow Californian species, but it is difficult to grow. The rhizome is slender, rudimentary leaves brown and very rigid. The true leaves are few to a tuft, thick and rigid, 1 to 2 ft. long, $\frac{1}{4}$ to $\frac{1}{2}$ broad, pale green and glossy above, glaucous beneath, edge revolute. The peduncle is one-headed, 2 to 3 in. or 1 ft. long, with small lanceolate bract leaves. The spathes are two-flowered, outer valves 2 to 2 $\frac{1}{2}$ in. long. The pedicels are long, perianth-tube nearly obsolete; limb 2 in. long, pale yellow; falls with an ovate blade, $\frac{1}{2}$ to $\frac{3}{4}$ in. broad, as long as the haft, veined with lilac; standards shorter, oblanceolate. The style branches are an inch long with very acuminate crests. Mr Purdy says that this and *I. Purdyi* are the only Pacific coast Irises with the stem having several brownish, short, closely-sheathing bracts, instead of short leaves sheathing at the base.

12. *I. Purdyi*, Eastwood in *Proceedings of the Californian Academy of Sciences*, 1897, *Botany*, vol. i. no. 2, p. 78. This Iris, according to the gentleman after whom it is named, has been cultivated as *I. macrosiphon*, and owing to the confusion that has existed among the Californian Irises and because the original description is given in a paper not easily consulted in this country, I give it nearly in full, but with measurements altered to terms of inches. "Rootstock slender, scarcely thicker than the fleshy root; leaves dark green or somewhat glaucous, glabrous, erect or laxly spreading, surpassing the scapes, $\frac{1}{4}$ in. wide, 8 to 16 in. long, with long acuminate apex, and margins membranous and shortly ciliate; scapes 6 to 8 in. long, slightly flattened, bracts generally over-

lapping, inflated, glaucous, striate, tinged with rose colour, acuminate; spathes usually two-flowered, similar to the bracts but more inflated and more rosy, especially on the margins; pedicels not quite $\frac{1}{2}$ in. long, about equalling the tube of perianth; perianth with throat slightly dilated above the junction of the style, falls oblong, $2\frac{1}{2}$ in. long, $\frac{3}{4}$ in. wide, rich cream colour, beautifully marked with fine lines of yellow on the claw, and with dotted veins of purple on the spreading blades; standards cream colour, somewhat shorter than the falls, widely spreading, linear oblong; stamens with filaments 2 in. long, $\frac{1}{2}$ in. wide, narrowing abruptly at the insertion of the anthers; anthers $\frac{5}{8}$ in. long; style slender, about $\frac{1}{2}$ in. long; stigmas $1\frac{1}{2}$ in. long including the crests which are $\frac{1}{2}$ in. long, lacinate on the outer edge, tinted with pale rose colour; stigmatic lip truncate slightly undulate; capsule oblong, tapering equally at both ends, valves nearly $\frac{1}{2}$ in. wide and $1\frac{1}{4}$ in. long."

Miss Alice Eastwood, who is the Curator of the Herbarium, says that this is an elegant Iris common in the Redwood region of Mendocino country around Ukiah. It has hitherto been included under *I. Douglasiana*, but it differs from all the Californian Irises in the peculiar bract-clothed flower stems (except we may assume *I. bracteata*). Mr Carl Purdy first detected this Iris as distinct from *I. Douglasiana* and it is therefore named after him. It grows in similar clumps but is less widely spreading.

According to Mr Purdy this plant is illustrated in *The Garden*, Aug. 14, 1897, under the name *I. macrosiphon*.

13. *I. sibirica*, L.; *Red. Lil.*, t. 420; Reich. *L. Fl. Germ.*, t. 341. This is one of the commonest of Irises always to be recognised apparently by its hollow stem.¹ It has a dense tufted habit. The leaves are green, not rigid, finely ribbed 1 to 2 ft. long, $\frac{1}{4}$ to $\frac{1}{2}$ in. broad.

¹ *I. Delevayi* also appears to have a hollow stem.

The stems are slender, terete, hollow, overtopping the leaves, simple or forked. The spathes are two to three flowered, valves lanceolate, brown, scariosse, 1 to $1\frac{1}{2}$ in. long. The perianth-tube is almost obsolete; limb $1\frac{1}{2}$ to 2 in. long, bright lilac blue; falls copiously veined, with an orbicular blade $\frac{3}{4}$ in. broad, narrowed gradually to a slender claw; standards rather shorter, erect, oblong, $\frac{1}{2}$ to $\frac{3}{4}$ in. broad. The style-branches are $\frac{3}{4}$ to 1 in. long, crests small, deltoid. It is native of Central and Southern Europe reaching to Eastern Siberia. There are several distinct varieties.

Var. *flexuosa* (*I. flexuosa* Ker in *Bot. Mag.*, t. 1163; *Red. Lil.*, t. 420) has flowers white with crisped segments. It was noticed by Lobel and Parkinson.

Var. *orientalis*; (*I. orientalis*, Thunb. in *Trans. Linn. Soc.*, ii. 328; *I. haematophylla*, Fisch. in Sweet, *Brit. Flo. Garden*, t. 1118; *I. nertchinskia*, Lodd. *Bot. Cab.*, t. 1843) has stem leaves tinged with red below, and red spathe-valves. The flowers are larger than those of the type, the blade of falls is orbicular, 1 to $1\frac{1}{4}$ in. broad. This is native of Eastern Siberia and Japan.

Var. *acuta* (Willd.), leaves stiffly erect; flowers pale blue with much white; stem and leaves half the usual height of usual forms.

A narrow leaved form is cultivated in the Cambridge Botanic Garden as var. *angustifolia*. There is also a double form, a white, a deep blue labelled *atrocaerulea* and one or two others.

This species is easy to grow, and is a useful kind to possess. It will do well on a dry bed, but prefers moisture. It would be interesting to raise seedlings with a view to selection and improvement. Good forms are valuable for effect. The variety *orientalis* is one of the best. Messrs Barr & Sons offer a new Japanese form, called "Blue King," no doubt a good one, and another called "Snow Queen," which must be very charming.

14. *I. Delavayi*, Micheli in *Revue Horticole*, 1895, p. 399, fig. 128, 129; *Jardin du Crest*, p. 189; *Bot. Mag.*, t. 7661. From the figure in the *Botanical Magazine* of 1899, this *Iris* must be very ornamental, but from the fact that I have good plants that have not flowered, it is not perhaps free-flowering. It is nearly allied to *I. sibirica*, and like it appears to have hollow stems which I have not found in any other *Iris*es. The green fruit is very distinct, for while that of *I. sibirica* is very obtusely angled and not much more than twice as long as broad, the fruit of this plant is sharply angled and about four times as long as broad. Moreover, the flowers have a distinct perianth-tube, and the flowers are without the venation characteristic of *I. sibirica*. There are other differences, but these amply serve to distinguish the one from the other. The hollow stem is a marked distinction for both, in comparison with the solid stem of other *Iris*es. *I. Delavayi* has a stout creeping rootstock; the leaves are 2 to 2½ ft. long by ¼ to ⅓ in. broad, erect, acuminate and strongly ribbed. The peduncle is longer than the leaves; spathes 2 to 2½ in. long, lanceolate, green with scarious tips; pedicels as long as the spathes. The flowers are 2 to 2½ in. across; tube ½ in. long; falls recurved; blade oblong, obtuse, deep violet blue with white streaks; haft as long as the blade, green with violet-white spotted wings; standards erect, oblong lanceolate of paler violet colour; stigmas oblong, pale violet; crests orbicular, crenulate; capsule 2 to 2½ in. long, triquetrous. Native of marshes in the province of Yunnan, China. Cultivation is quite easy but moisture is necessary.

15. *I. missouriensis*, Nutt. in *Journ. Acad. Philad.*, vii. 58; *I. Tolmieana*, Herb. Sheath-leaves brown and rigid, not splitting into fibres as in *I. longipetala*. The leaves are firm, pale green, 1 to 1½ ft. long at flowering time, ¼ to ½ in. broad. The stem is one-headed, 1 to 2

ft. long, with single linear leaf low down. The spathe is two to four flowered, outer valves lanceolate, 2 to 3 in. long. The pedicels are long, perianth-tube very short; limb $1\frac{1}{2}$ to 2 in. long, lilac; falls obovate-cuneate, $\frac{3}{4}$ to 1 in. broad, with blade as long as haft; standards oblong, $\frac{1}{3}$ to $\frac{1}{2}$ in. broad. The style branches are an inch long, the crests broad. The capsule is $1\frac{1}{2}$ to 2 in. long, deeply grooved, narrowed to both apex and base. It is native of the Rocky Mountains and from California to North Mexico, where it ascends to 10,000 ft.

The figure in the *Botanical Magazine* under this name, t. 6579, represents *I. longipetala* var. *montana*, Baker. The plate in *Garden*, 1896, Sept. 5, 1032, is probably correct. Mr Carrington Ley, whose plant was figured, says it is one of the earliest to flower, with light green linear leaves and light lilac flowers—a lovely plant. *I. longipetala* has distinctly glaucous leaves.

16. *I. prismatica*, Pursh, Ker in *Bot. Mag.*, t. 1504; *I. virginica*, A. Gray, not of Linn. This can hardly be described as ornamental, but I grew it without trouble on a moist bed for several years. The rhizome is slender, leaves weak, a foot or more long, $\frac{1}{8}$ in. broad. The stem is slender, 1 to 2 ft. long, simple or forked, with two to three linear leaves. The spathes are one to two flowered; valves somewhat rigid, 1 to $1\frac{1}{2}$ in. long; pedicels often much longer. The perianth is nearly obsolete; limb bright lilac, $1\frac{1}{2}$ to 2 in. long; falls with an obovate blade $\frac{1}{2}$ in. broad, shorter than the haft; standards shorter, oblanceolate, $\frac{1}{8}$ in. broad; crests narrow. It is native of the Northern United States.

17. *I. graminea*, Linn.; *Bot. Mag.*, t. 681; *Red. Lil.*, t. 299; Reich. *Fl. Germ.*, t. 346. Anyone fond of Irises would like this species, but it is not one of the most showy. It forms dense tufts; the leaves are thin, conspicuously green, and not glaucous, strongly ribbed and 1 to $1\frac{1}{2}$ ft. long, $\frac{1}{8}$ to $\frac{1}{4}$ in. or more broad. The

stem is slender, shorter than the leaves, compressed, one-headed, and bearing one or two large leaves. The spathe is two-flowered, valves lanceolate, about 2 in. long; pedicels 1 to 2 in. long. The perianth-tube is nearly obsolete; limb deep lilac and conspicuously veined; falls with orbicular blade $\frac{1}{2}$ in. broad, much shorter than the broad haft; standards oblanceolate, erect, nearly as long, $\frac{1}{4}$ in. broad. The capsule is small and suddenly rostrate. It is native from France to Greece and the Caucasus. Mr Baker refers to *I. sylvestris*, Balbis, as a robust variety with leaves $\frac{1}{2}$ to $\frac{1}{4}$ in. broad; also to *I. lamprophylla*, Lange, in *Bot. Tids.*, xiii. 17, t. 1, which differs by its broader leaves, more scariose spathe-valves and larger flowers. In the Cambridge Botanic Garden is grown a variety *inodora* and a variety *latifolia*. A merit of this plant is that it grows readily on any bed or border.

18. *I. longipetala*, Herb.; Hook. fil. in *Bot. Mag.*, t. 5298. The rhizome is stout, sheaths slitting into coarse fibres. The leaves are firm, 1 to $1\frac{1}{2}$ ft. long, $\frac{1}{2}$ to $\frac{1}{4}$ in. broad, and glaucous. The stem is stout, solid, compressed, 1 to $1\frac{1}{2}$ ft. long, bearing one or two linear leaves and a single head. The spathes are two to four flowered, outer valves green, linear or lanceolate, 3 to 4 in. long, and pedicels 1 to 3 in. long. The perianth-tube is nearly obsolete; limb bright lilac, $2\frac{1}{2}$ to 3 in. long; falls obovate, an inch or more broad, the claw keeled with yellow and copiously veined with violet on a white ground; the standards are much shorter, oblanceolate, $\frac{1}{4}$ in. broad; style branches $1\frac{1}{2}$ in. long; crests large and deltoid.

Var. *montana*, Baker (see accompanying plate). This is a smaller plant, dwarfer, less spreading, or hardly at all spreading, leaves narrower, $\frac{1}{4}$ to $\frac{1}{2}$ in. broad, with smaller flowers. It is figured in the *Botanical Magazine*, 1881, t. 6579, as *I. missouriensis*, under which name it is well known.



IRIS LONGIPETALA MONTANA

Both type and variety are well worth growing. They are easily cultivated on bed or border, and are quite distinct for garden purposes.

19. *I. tripetala*, Walt. *Fl. Carol.*, t. 66, not of Linn.; *I. tridentata*, Pursh; Sweet, *Brit. Flow. Gard.*, t. 274. This is regarded as one of the most distinct of the Apogons, and is known from all others with linear leaves by its very small standards. The leaves are 1 to 1½ ft. long and ¼ in. broad; stem 1½ to 2 ft. long with from one to three heads; outer valve 2 to 2½ in. long, much longer than the inner; pedicels long; perianth-tube narrowly funnel-shaped, under 1 in. long; limb bright lilac, 2½ to 3 in. long; falls with orbicular blade 1 in. or more in breadth equalling the haft; standards oblanceolate, erect, ½ in. long; crests lanceolate. A native of the Southern United States from Carolina to Florida. I have little experience of its cultivation, but it requires moisture.

II. LEAVES ENSIFORM.

20. *I. maculata*, Baker in *Gard. Chron.*, 1876, ii. 517. I am not sure that this is now in cultivation. It is the only dwarf species of this group. The rhizome is slender; leaves ½ ft. long at flowering time; stem 3 to 4 in. long, one-headed, with single leaf low down; spathe 2 to 3 in. long, one-flowered; pedicel short; perianth-tube 1 in. long; limbs 2½ in. long; falls obovate-cuneate, 1 in. broad, pale with blue or lilac central spot; standards equalling the falls in length, oblong, cuspidate, ½ in. broad; crests broad, obtuse, sub-entire. Habit of *I. caucasica*, native of Mesopotamia.

21. *I. Hookeri*, Penny; *I. tripetala*, *Bot. Mag.*, t. 2886. A near ally of *I. setosa* and quite distinct from *I. Hookeriana* of the *Pseudevansia* section. Like *I. tripetala* among linear leaved species, this may be

recognised, with *I. setosa*, among species with ensiform leaves by its small standards. From *I. setosa* it may be known by its glaucescent leaves. They are 1 to $1\frac{1}{2}$ ft. long by $\frac{3}{4}$ in. broad. The stems overtop the leaves, are two to three headed, and bear two to three large leaves; pedicels an inch or more long; perianth-tube cylindrical, $\frac{1}{2}$ to $\frac{1}{2}$ in. long; limb bright lilac, 2 to $2\frac{1}{2}$ in. long; falls with nearly round blade an inch broad, as long as the haft, and suddenly narrowed to it; standards erect, obovate, $\frac{1}{2}$ in. long; crests small, deltoid. Habit of *I. versicolor*, but easily distinguished by its standards. Native of Canada.

22. *I. setosa*, Pallas; Regel, *Gartenfl.*, t. 322; *I. brachycuspis*, Fisch in *Bot. Mag.*, t. 2326. A well-known but not a popular Iris. The rhizome is stout, sheaths splitting into fine fibres; leaves thin, green, 1 to $1\frac{1}{2}$ ft. long, $\frac{1}{2}$ to 1 in. broad; stem deeply forked, much overtopping the leaves, bearing two to three heads and two to three large leaves; spathes two to three flowered; pedicels, 1 to $1\frac{1}{2}$ in. long; perianth-tube cylindrical, $\frac{1}{2}$ in. long; limb bright lilac, 2 to $2\frac{1}{2}$ in. long; falls with orbicular blade more than an inch broad, narrowed suddenly to much veined haft; standards $\frac{1}{2}$ in. long, cuneate, with large cusp; crests deltoid. Native of Eastern Siberia, Japan and N.W. America.

23. *I. Pseudacorus*, Linn. *Eng. Bot.*, t. 578 (vol. ix. of 3rd ed.). This is the Yellow Flag, common throughout Britain along river banks and ditches. It is known also as the Yellow Water Iris, Jacob's Sword, Water Flag and Yellow Fleur de Luce. So familiar a plant can hardly need much description. It has a stout, creeping, acrid rhizome; leaves 2 to 4 ft. long, $\frac{1}{2}$ to 1 in. broad; stem 2 to 4 ft. high, leafy, often branched at the top; pedicel about as long as the ovary; flowers 3 to 4 in. in diameter, variable in shade of yellow colour and in form of segments; tube cylindric; falls often



ENGLISH FLAGS

purple veined, with an orange spot near the base. The distribution is through Europe, N. Africa and Siberia. The following are recognised forms:—

- Falls deep yellow, with orange spot at the base of oval blade; standards oblong, rather abruptly narrowed to haft the type
- Falls deep yellow, with orange spot at the base of nearly round blade; blade of standard gradually narrowed to haft var. *acoriformis*
- Falls pale yellow, without orange spot at the base of oblong oval blade; blade of standards rather abruptly narrowed to haft var. *Bastardi*

This species is supposed to have furnished the heralds with the device called "Fleur-de-lys," which, tradition says, was adopted by Louis VII. for the bearings of France, deriving its name from the river Lys, on the borders of Flanders, on the banks of which it was abundant. With sulphate of iron the juice yields a black dye, and the plant has been formerly used in medicine, as well as for a cosmetic. It was once held sacred to the Virgin Mary.

Very little has been said about this species in garden literature, but undoubtedly it is highly ornamental and capable of good effect. No plant could be more easily grown wherever there is water or constant moisture, and for "wild" gardening it deserves to be remembered.

24. *I. tenuis*, S. Wats. in *Proc. Amer. Acad.*, xvii. 380. This may not now be in cultivation. It has a slender rhizome; very thin green leaves 12 to 15 in. long, $\frac{1}{2}$ in. broad at the middle, gradually narrowed to the point. The stem is very slender, about a foot long, forked, bearing two heads; leaves of stem small and

linear ; spathes one-flowered ; ovary on stalk ; perianth-tube very short ; limb white, $1\frac{1}{2}$ in. long, faintly veined with yellow and lilac ; blade of falls $\frac{1}{2}$ in. broad, as long as haft ; standards rather shorter. Native of Oregon.

25. *I. fulva*, Muhl. ; Ker in *Bot. Mag.*, t. 1496 ; *I. cuprea*, Pursh ; *The Garden*, June 18, 1898, plate 1175. Standing quite alone in point of colour, this Iris is one of but two which have spreading standards. The other is *I. laevigata*, familiar in gardens under the name *I. Kaempferi*, which is usually applied to the cultivated forms. The rhizome is stout ; the leaves bright green, $1\frac{1}{2}$ to 2 ft. long, $\frac{1}{2}$ to 1 in. broad ; stems 2 to 3 ft. long, and forked low down, bearing about three heads ; spathes two to three flowered ; pedicels produced ; perianth-tube yellowish, about an inch long ; limb 2 in. long, of bright fulvous brown colour, very like that of *Hemerocallis fulva*, all the segments spreading from below the middle ; falls obovate-cuneate, $\frac{3}{4}$ to 1 in. broad, with reddish brown pubescence about the keel ; standards shorter than the falls ; crests small and broad. Mr Baker regards this plant as connecting the sections Apogon and Pogoniris. It flowers late in June, is easily cultivated, but does not flower freely. The rhizomes must be kept strong, by removing the weaker, otherwise it may not flower at all. I grow it and flower it on a mound of the bog garden, where the roots can reach water. In some gardens it grows on an ordinary border, but it is a moisture-loving plant. It is a native of the United States, principally in the south, but is quite hardy.

26. *I. laevigata*, Fisch. and Mey. ; Hook. fil. in *Bot. Mag.*, t. 6132 ; *I. Kaempferi*, Siebold, *Ill. Hort.*, t. 157 ; *Fl. des Serres*, t. 2073-4. Not only is this one of the finest of all Irises, but it is also one of the finest hardy plants that can be grown. It has a close tufted habit. The leaves are green, 1 to $1\frac{1}{2}$ ft. long, $\frac{1}{2}$ to $\frac{3}{4}$ in. broad.

The stems overtop the leaves, bearing two to three reduced leaves, with usually one head of flowers. The spathes are 2 to 3 in. long, outer valves green, lanceolate; pedicels $\frac{1}{2}$ to 1 in. long. The perianth-tube is funnel-shaped, $\frac{1}{2}$ in. long; limb $2\frac{1}{2}$ to 3 in. or more long, spreading to a width of from 5 to 8 in., varying in colour from white to all shades of purple and even pale crimson; the blade of fall is longer than the haft, its width $1\frac{1}{2}$ to 2 in. The standards are described as shorter, oblanceolate, and $\frac{1}{2}$ in. broad, but in garden forms this is subject to increase. The style branches exceed an inch in length; the crests are large and deltoid. This species is native in Eastern Siberia and in Japan, whence clumps are frequently imported. It was originally introduced from Japan by Von Siebold, and flowered in Verschaffelt's Nursery at Ghent in 1857. For cultivation see Part I. Among best garden forms are the following :—

Alexander von Humboldt, pure white.

Chiya, lilac and white.

Her Majesty, violet speckled white.

Keiko, blush suffused and speckled rose.

Lady Scott Moncrieff, white with rosy halo.

Netta, white, edged rose pink.

Ozaka, pale sky-blue, passing to white with golden blotch.

Lomoye, pure white, with light blue halo and golden blotch.

In the Kew list of herbaceous plants I find "*I. laevigata* $\times$ *Xiphium*, see *hyerensis*." I have flowered a plant received as *I. hyerensis*, but it had no resemblance with either of its supposed parents. What is its history?

27. *I. versicolor*, Linn.; Curt. in *Bot. Mag.*, t. 21; *Red. Lil.*, 339. The rhizome is stout, sheaths splitting into fine fibres; leaves slightly glaucous, $1\frac{1}{2}$ to 2 ft. long, an inch broad; stems $1\frac{1}{2}$ to 2 ft. long, deeply forked,

with two to three heads, and bearing two to three large leaves. The spathes are two to three flowered, outer valves lanceolate, green, $1\frac{1}{2}$ to 2 in. long; pedicels much shorter than the spathe. The perianth-tube is very short, limb $1\frac{1}{2}$ to 2 in. long, claret-purple; falls obovate-cuneate, $\frac{3}{4}$ to 1 in. broad; claw veined with purple on yellowish white ground; standards much shorter, ob-lanceolate, $\frac{1}{4}$ in. broad; crests small and subquadrate, white (as figured). The style arms are represented as distinctly raised above the falls.

Var. *virginica* (*I. virginica*, Linn.; *Bot. Mag.*, t. 703; *Jacq. Ic.*, t. 233). Compared with type, this variety has a longer limb and is of lighter colour—blue-purple instead of red-purple. The falls have a larger sub-orbicular blade, much veined at the throat with violet on pale ground. The style branches are longer, and in figure are represented as recurved on the falls. Messrs Barr & Sons have a form called “China Blue”—“a rather fine new Iris.”

This species is common in British North America and in the Northern United States, extending to Hudson's Bay. It grows in marshes, thickets and wet meadows. Moisture is thus indicated, but I have had both type and variety growing well on a border. The rhizomes and rootlets of *I. versicolor* yield an oleo-resin, Irisin. An extract is used in dropsy and diseases of the liver.

28. *I. albopurpurea*, Hook. fil. in *Bot. Mag.*, t. 7511; *Garden*, 1899, Dec. 23, plate 1254. The nearest ally of this fine Iris is *I. hexagona*, from which it differs at a glance in having a spotted flower. The rhizome is shortly creeping; leaves green, 2 ft. long and nearly 1 in. broad when fully developed, not firm in texture. Stem moderately stout, one-headed, not overtopping the leaves. Flowers usually three, opening in succession; outer spathe-valves green at flowering time, 2 in. long; pedicels $\frac{3}{4}$ in. long; ovary trigonous; perianth-tube $\frac{1}{2}$ in.

long, cylindrical; falls obovate, deflexed, 3 to $3\frac{1}{2}$ in. long by $1\frac{1}{2}$ in. broad, white spotted with violet or pale purple; standards erect, pure white, lanceolate, rather shorter than the falls, $\frac{1}{2}$ in. broad; crests large, hardly at all oblique, oval, and entire, the inner edges overlapping. The style is free in the tube of perianth.

It was introduced from Japan with an importation of *I. Kaempferi* and requires the same general culture but does not apparently dislike lime. It does well on a wet mound in the bog garden at Cambridge, flowering during the latter half of June.

29. *I. hexagona*, Walt.; Baker in *Bot. Mag.*, t. 6787. The rhizome is wide creeping; leaves slightly glaucous, 2 to 3 ft. long and 1 in. broad. The stems are 3 to 4 ft. long with several heads and several large leaves; spathes three to four flowered; outer valves lanceolate and green, sometimes long and leaf-like; pedicel produced. The ovary has three deep and three shallower grooves; perianth-tube cylindrical, $1\frac{1}{2}$ in. long (described as 1 in. long), with many grooves; limb 4 to 5 in. long, dark, pale lilac or white; falls with an obovate blade, $1\frac{1}{2}$ to 2 in. broad; the claw broad, downy and greenish, with a distinct ridge down the centre; standards shorter, erect, oblanceolate; style branches $1\frac{1}{2}$ in. long, very concave, green, with a central lilac band, narrower than the claw of fall; crests deltoid, toothed. The style is free in perianth-tube. Native of the Southern United States, from Kentucky to Texas and Florida.

The plant introduced is tender, but Mr Gerard says the northern forms are hardy. It is not free flowering, and was first flowered in this country in the Cambridge Botanic Garden by planting out on a border. The rhizomes must be able to run to some length. It has lived for some time against a wall out of doors in favoured position.

A plant introduced as *Lamancei*, and referred to *hexagona* as a variety, has a strongly flexuous stem with

about four leaves much overtopping the flowers. Growing at Kew it seems to be quite distinct. It is described as having falls 2 in. long, rich purple with blue shading to white and a marking of yellow down the claw. The styles are light green. It is said to be native of Arkansas and to be hardy.

30. *I. foetidissima*, Linn.; *Eng. Bot.*, t. 596; *Red. Lil.*, t. 354; Reich. *Lc. Germ.*, t. 347, *Fl. Germ.*, fig. 975. Roast-beef plant, Gladwyn. The scent of the broken leaves, which has been compared to roast beef, boiled milk, and wet starch, is sufficient to distinguish this plant from all others. It has a stout, shortly creeping rhizome, the sheaths fibrous. The leaves are deep green, but slightly glaucous, $1\frac{1}{2}$ to 2 ft. long, $\frac{3}{4}$ to 1 in. broad. The stem is compressed, 2 to 3 ft. long, bearing 2 to 3 reduced leaves and 2 to 3 heads; spathes, 2 to 3 flowered, 3 in. long, the outer valves lanceolate, green; pedicels long. The perianth-tube is greenish, funnel-shaped, $\frac{1}{2}$ in. long; limb, $1\frac{1}{2}$ to 2 in. long; the falls in the type are pale purplish blue with purple lines; petals lined with slaty blue; crests deltoid. The seeds are globose and have a fleshy orange testa, which shrivels on drying and becomes dark red.

A variety, *citrina*, is recognised in English botany, and has flowers wholly pale lemon yellow, without purple lines. It occurs in the Isle of Wight and in Dorset. The type is not uncommon in the south of England; it is rare in Ireland and introduced only in Scotland. The species is distributed through Central and Southern Europe.

Usually grows in shade, is not ornamental in flower, but highly so in the open pods, showing the brilliantly coloured seeds. Culture is quite easy, but the plant is not a fast grower. There is a variegated leaved variety.

31. *I. spuria*, Linn.; *Bot. Mag.*, t. 58; Reich, *Fl. Germ.*, fig. 772. A common species in botanic gardens,

easily recognised under various names by its narrow hard leaves, flowers of some shade of lilac, and its six-ribbed and beaked fruit. *I. Guldenstaediana*, which can hardly be separated as more than a variety, has yellow or yellowish flowers. The whole plant is strongly fibrous and tough. The rhizome is stout, short creeping, sheaths splitting into fibres. The leaves are linear, glaucescent, about a foot long and $\frac{1}{2}$ in. broad in the type. The stems overtop the leaves, bearing 1 to 3 spicate heads and 3 to 4 reduced leaves; spathes, 2 or 3 flowered, 2 to 3 in. long, valves green lanceolate; pedicels shorter than the spathe. The perianth-tube is $\frac{1}{2}$ to $\frac{3}{4}$ in. long, limb lilac, $1\frac{1}{2}$ to 2 in. long; falls with an orbicular blade, $\frac{1}{2}$ in. broad and half as long as the haft, the latter keeled with yellow and veined with lilac on a pale ground; standards rather shorter, oblanceolate, $\frac{1}{2}$ to $\frac{1}{2}$ in. broad; crests small and deltoid. The capsule, as above mentioned, is beaked and ribbed. There are several varieties.

Falls faintly bearded down the haft,
spathe-valves puberulous at the
apex.

var. *subbarbata*.

(*I. subbarbata*, Joo.)

Segments pale lilac, haft of falls
bright yellow, standards bordered
with yellow.

var. *desertorum*.

(*I. desertorum*, Ker in *Bot. Mag.*,
t. 1514.)

More robust than type with leaves
an inch broad, flowering stems
2 to 3 ft. long, flowers and
spathe-valves larger. Native
Caucasus to Kashmir.

var. *notha*.

(*I. notha*, Bieb; *I. halophila*, Ker in
Bot. Mag., t. 875; *I. spuria*,
Red. Lil., t. 349.)

The culture of all varieties is very easy on any bed or border. There is a white form, and also one of soft lavender, known as A. W. Tait. A very fine *spuria* is called Dorothy Foster.

32. *I. Guldenstaediana*, Lepech; *I. halophila*, Pallas; *I. stenogyne*, Red. Lil., sub. t. 310. I follow Baker in treating this as a distinct species. Description may be regarded as the same as for *I. spuria*, except in the following differences—leaves green, ensiform, $\frac{1}{2}$ to $\frac{3}{4}$ in. broad; flowers pale yellow (in the type); falls $\frac{1}{2}$ to $\frac{3}{4}$ in. broad; style branches 1 to $1\frac{1}{4}$ in. long.

Like the preceding this does well on any bed or border.

33. *I. aurea*, Lindl., Bot. Reg., vol. 33, t. 59. This and the two following form a very natural group, having the same habit and general appearance, with rich green and robust foliage. They are the only broad-leaved Apogons with beaked, strongly ribbed fruits and large standards. This species differs from the other yellow flowered kind by having standards which do not exceed $\frac{1}{2}$ in. in width. The rhizome is stout; the leaves green, hardly at all glaucous, $1\frac{1}{2}$ to 2 ft. long, $\frac{3}{4}$ to 1 in. wide. The stem is 3 to $3\frac{1}{2}$ ft. long, stout, with several reduced leaves, and two sessile heads below the terminal one; spathes 2 to 3 flowered, 3 to 4 in. long; valves green lanceolate; pedicels long. The perianth-tube is as long as the ovary, limb bright yellow, $2\frac{1}{2}$ to $3\frac{1}{2}$ in. long; falls with an oblong blade an inch broad; standards, shorter oblanceolate, under $\frac{1}{2}$ in. broad; style branches $1\frac{1}{4}$ to $1\frac{1}{2}$ in. long; crests deltoid. A native of the Western Himalayas. It flowers in July, rather later than its two relatives, and does well on an ordinary border, but in the Cambridge Botanic Garden it does not flower freely. At Kew a variety *intermedia* is cultivated.

34. *I. Monnieri*, D.C., in Red. Lil., t. 236. The

leaves are slightly glaucous, 2 to 3 ft. long, 1 to $1\frac{1}{2}$ in. broad. The stem is stout, 3 to 4 ft. long, with several reduced leaves and sessile clusters of flowers; spathes 2 to 3 flowered, 4 to 5 in. long, the outer lanceolate an inch broad; pedicels long. The perianth-tube equals the ovary in length; the limb is $2\frac{1}{2}$ to $3\frac{1}{2}$ in. long, bright yellow, without dark veins; falls with an orbicular blade 1 to $1\frac{1}{2}$ in. broad, equalling the claw in length; standards shorter oblong, an inch broad; style branches $1\frac{1}{2}$ in. long, crests deltoid; capsule 2 in. long, conspicuously beaked. A native of Rhodes and Crete. Is quite easily cultivated on any bed or border.

A hybrid called "Monspur" has been raised by Sir Michael Foster. It is very ornamental.

35. *I. orientalis*, Miller; *I. ochroleuca*, Linn.; Curt. in *Bot. Mag.*, t. 61; *Red. Lil.*, t. 350. This must not be confounded with a plant often grown as *I. orientalis*, which is only a variety of *I. sibirica*. In gardens this plant is most commonly called *I. ochroleuca*. It is easily recognised in this group by its yellow and white flowers. The rhizome is short and stout. The leaves are 2 to 3 ft. long and an inch broad. The stem is 3 ft. long with 2 to 3 reduced leaves and 2 to 3 clusters of flowers; spathes 2 to 3, flowered 4 to 6 in. long, valves lanceolate, acuminate, an inch broad; pedicels long. The perianth-tube is cup-shaped, $\frac{1}{2}$ in. deep; the ovary is strongly ribbed, and with its beak measures 2 in. long; the limb is 3 to $3\frac{1}{2}$ in. long; blade of falls obovate, an inch broad; standards shorter, orange-yellow in the centre, margined with white and white in colour; style branches $1\frac{1}{2}$ in. long and remarkably stiff; crests deltoid. The filaments are lanceolate, thick and stiff, shorter than anthers. The capsule is $1\frac{1}{2}$ to 2 in. long, strongly beaked. A native of Asia Minor and Syria.

Var. *gigantea* (*I. gigantea*, Carrière). This is the

tallest of known Irises, attaining a height of perhaps 6 ft. It is otherwise hardly distinct from the type.

I. orientalis was found by Boissier in marshes to the west of Smyrna, and I have seen it growing finely with considerable moisture, but nevertheless it does well on an ordinary border. The variety *gigantea* is said to be good as a seaside plant.

The hybrid "ochaurea," raised by Prof. Sir Michael Foster, is a fine plant, more free-flowering than *orientalis*. Its parents are *orientalis* and *aurea*. The falls are of rich yellow colour, bordered with cream; the standards are erect and yellowish, bilobed at the apex. Its height is about 5 ft. The first part of the name is taken from *achroleuca*, the most usual designation for the plant we must call *orientalis*.

CHAPTER VIII

PARDANTHOPSIS

36. *I. verna*, Linn., *Sweet Brit. Fl. Gard.*, t. 68 (see accompanying plate). An interesting and pretty plant, but not showy. As grown in the Cambridge Botanic Garden, the flowers agree perfectly with the figure quoted above, but the rhizome is quite different. It is short, creeping, moderately stout, with short internodes. The leaves are linear, bright green above, slightly glaucous below, about 6 in. long and $\frac{1}{2}$ in. wide (are described as $1\frac{1}{2}$ ft. long), persistent through the winter. The stem is very short, entirely hidden by bracts, one-headed, spathe-valves about four, $1\frac{1}{2}$ to 2 in. long, lanceolata, pedicel short. The perianth-tube is slender, $1\frac{1}{2}$ to $1\frac{3}{4}$ in. long; limb violet-purple, $1\frac{1}{2}$ in. long; falls obovate-cuneate, rather more than $\frac{1}{2}$ in. broad at broadest part, with a splendid golden line proceeding from $\frac{1}{2}$ in. below apex of blade down the claw flanked with white; a characteristic pubescence¹ not forming a linear beard is easily seen with a good lens, as also are linear tufts of remarkable awl-shaped brown hairs, which form lines into the golden area from the purple; standards erect, broadly ovate, unguiculate, the unguis forming a channel by its upturned edges; style-arms $\frac{1}{2}$ in. long, with crests of equal length obliquely oblong, very slightly laciniate at the apex. Is a native of Ohio, Kentucky, Virginia,

¹ This pubescence is not unique, as I find precisely the same, including the awl-shaped hairs, in one of the forms of *spuria*. There is reason for regarding *I. verna* as an *Apogon*, and certainly it agrees in the peculiar leaf-character of one or two American kinds.

and other Southern States, growing in woods or on shaded hillsides. In this country it flowers in May and is easily cultivated, either in pans of peaty soil surfaced with sphagnum, or on a peaty border in shade. It is a moisture-loving plant, and the sphagnum should be kept alive by sufficient water, though not necessarily in winter.



IRIS VERNA

CHAPTER IX

Evansia

(CRESTED IRISES)

LEAVES sword-shaped.

Stems erect or ascending; leaves
dark green, not glaucous . 37. *I. JAPONICA*.

Stems rhizomatous, stout; leaves
1 to 2 ft. long.

Perianth-tube, $\frac{1}{2}$ in. long . 38. *I. MILESII*.

— — 1 in. or more

long 39. *I. TECTORUM*.

Stems rhizomatous, slender;
leaves much less than a foot
long.

Perianth-tube $\frac{1}{2}$ to $\frac{3}{4}$ in.

long 40. *I. LACUSTRIS*.

Perianth-tube $1\frac{1}{2}$ to 2 in.

long 41. *I. CRISTATA*.

Leaves narrow and long.

Flowers, with pedicels, $\frac{1}{2}$ in.

long 42. *I. SPECULATRIX*.

Flowers without pedicels . 43. *I. GRACILIPES*.

37. *I. japonica*, Thunb.; *I. chinensis*, Curt. in *Bot. Mag.*, t. 373; *I. fimbriata*, Vent. This beautiful Iris is not an unfrequent inhabitant of our greenhouses. It has a stout, more or less erect, rhizome 6 in. or more long, while below ground slender stolons are produced. The leaves are a foot or more long, and differ conspicuously from those of most Irises in their bright

green colour. The inflorescence, a lax panicle, is supported by a stem as long as the leaves. The spathes are composed of several lanceolate valves, producing three or four flowers in succession. They are rather fugitive, but of most lovely lilac colour. The perianth-tube is $\frac{3}{4}$ in. long; the standards and falls are both spreading, about 1 or $1\frac{1}{2}$ in. long, the former about $\frac{3}{4}$ in. broad, the latter rather less. The falls are crisped and fimbriated at the edge, ornamented with yellow at the throat, and have a ciliated petaloid crest with other faint ridges. The style branches are $\frac{1}{2}$ to $\frac{3}{4}$ in. long, and their appendages are deeply fimbriated. Culture is quite easy in a greenhouse with ordinary treatment. The plant is too tender for growing out-of-doors; though it lives at the foot of a wall in the Cambridge Botanic Garden, it seems little inclined to flower. On the Riviera it is sometimes very effective, and would be worth trying on the southern shores of Devon and Cornwall; it is a native of China and Japan.

38. *I. Milesii*, Foster in *Gard. Chron.*, 1883, i., 231; Baker in *Bot. Mag.*, t. 6889. This is a good ornamental plant, and is looked upon as quite hardy. It should still have a sheltered position, and may be planted at the foot of a greenhouse wall. A good figure will be found in the *Botanical Magazine* prepared from a specimen which flowered in the Cambridge Botanic Garden in May 1886. The leaves are pale green and slightly glaucous, about 2 ft. long, reducing upwards to the inflorescence. The spathes are many-flowered, and about $1\frac{1}{4}$ to $1\frac{1}{2}$ in. long, pedicels articulated at the apex and as long as the spathes. The flowers are not quite 4 in. across, the tube is $\frac{1}{2}$ in. long, falls claret-purple about $\frac{3}{4}$ to 1 in. broad, with pale centre conspicuously spotted and veined with lilac, and furnished with a sharply toothed yellow crest, so finely divided as to suggest that this plant furnishes a link with the bearded Irises. The hairs clearly pro-



IRIS CHINENSIS



ceed from a single ridge. The standards are spreading, like the falls, and lilac in colour. The styles are lilac, with deeply fringed, conspicuous appendages. A native of North-Western Himalayas, at an elevation of 14,000 ft., whence it was introduced by the late Mr Frank Miles.

39. *I. tectorum*, Maxim. in *Bull. Acad. Petersb.*, vol. vii. p. 563; Hook. fil. in *Bot. Mag.*, t. 6118; *I. torniolotha*, Hance in *Trimen Journ.*, 1872, p. 229. This is one of the most beautiful of all Irises, and is fortunately quite hardy on any sheltered border. It is well illustrated in the *Gardeners' Chronicle* of July 6th, 1876, p. 37, and the flower is there shown to be nearly 6 in. across. The rhizome is as thick as a man's thumb, creeping on the surface of the ground and not producing the stolons usual in this section. The leaves are pale green, slightly glaucous, above a foot long and an inch or more broad. The stem is more than a foot high, with a large leaf in the middle and a single terminal, two to three flowered spathe of three almost membranous valves, $1\frac{1}{2}$ to 2 in. long. The pedicels are much shorter than the spathe, and the perianth-tube is an inch long or more. The falls have a nearly round blade, $1\frac{1}{2}$ in. broad; they are bright lilac in colour, variegated with darker lilac, and are white at the throat. The crest is lilac and white, deeply lacinated. The standards are spreading, like the falls, but are coloured plain lilac. The plant was introduced by Mr William Bull about 1874. Mr A. Perry, of Winchmore Hill, has an exceedingly charming pure white variety. It is a native of China and Japan. The Chinese grow it on the roofs of their houses, hence the name *tectorum*. There is no difficulty in growing this really handsome plant, but it should be kept dry in winter.

40. *I. lacustris*, Nutt. *Gen. Amer.*, i. 23. I am unable to say that this small species is worth general

culture. It is an interesting plant and even attractive, suitable for Botanic Gardens and collectors of the uncommon. It has been grown in the Cambridge Botanic Garden for a number of years, and has given little trouble, growing in a six-inch pot. No doubt it is hardy, but some plants are most conveniently kept immediately under the eye in a frame. The only figure is in Britton and Brown's *Illustrated Flora of the Northern States and Canada*, vol. i. p. 451. Like the next, it has very short flowering stems, which are one-headed. The flowers are lilac, and all the segments are nearly equal in size, measuring only $\frac{1}{4}$ to $\frac{3}{8}$ in. wide. The falls are obovate, and have a yellow fimbriated crest down the claw. The slender rhizome and short perianth-tube distinguish it easily from all other species of this section. It is native on the shores of Lakes Huron and Superior.

41. *I. cristata*, Ait. *Hort. Kew.*, i. 71; *Bot. Mag.*, t. 412. For the garden this species is much better than the last. It is very nearly allied, but is quite easily distinguished by the perianth-tube, which is twice longer. It is of much stronger growth, and in Fraser's Nursery at Comely Bank, Edinburgh, I have seen it forming great masses. At Cambridge its growth is much more limited, due, no doubt, to drier climate. It appears to be quite hardy. The slender rhizome is wide-creeping, and sends out long stolons. The leaves are ensiform, 6 to 8 in. long, $\frac{1}{2}$ to $\frac{3}{4}$ in. broad. The pedicel or flower-stalk is of the same length as the ovary, about $\frac{1}{2}$ in. long; the tube is filiform, $1\frac{1}{2}$ to 2 in. long; colour of flower pale lilac; falls with reflexed obtuse blade, $\frac{1}{2}$ in. broad, as long as the claw; throat and crest yellow; the standards are erect, $\frac{1}{2}$ to $\frac{3}{8}$ in. broad, rather shorter than the falls. The stigmas, including appendages, are half as long as the falls. This species was grown as long ago as 1766 in the

garden of Collinson. It is native on hillsides and along streams in Maryland, Ohio, Kentucky, and other States of America.

42. *I. speculatrix*, Hance in *Trimen Journ.*, 1875, p. 196, 1876, p. 75; Baker in *Bot. Mag.*, t. 6306. I fear that this is now lost. It is a pretty plant, however, and may be re-introduced. The flowers have struck me as very *Moraea*-like, and in the *Botanical Magazine* it is said that its general habit is more like that of one of the Capeor Angolan *Moraea*s than that of the ordinary *Irises* of the North Temperate Zone. From *Moraea* it differs very distinctly in having a perianth-tube. It is very distinct, even as an *Evansia*, differing from the one other grassy leaved species in having a short pedicel. The present plant has a tortuous rhizome as thick as a goose quill, stems one-headed, less than a foot high with two or three bract-like leaves. The prevailing colour of the flower is lilac, but the falls have a white blotch following the outline of the fall in shape, with a dark ring of violet surrounding it. The crest is yellow. It was discovered in the mountains of Hongkong by a Chinese workman of the Botanic Garden there.

43. *I. gracilipes*, A. Gray, *Bot. Jap.*, 412; *Bot. Mag.*, 1903, t. 7926. With the introduction of this plant, a short time since, all the *Evansias* are now, or have been, in cultivation. Originally received from Herr Max Leichtlin, a charming plant in a pot, sent from the Cambridge Botanic Garden, has supplied a figure for the *Botanical Magazine*. The flowers unfortunately are rather fugacious. The flowering rhizome produces several small branches forming a tuft; sheaths membranous, but not conspicuous. The leaves are thin, pale green, about 6 in. long at flowering time, but capable of attaining a foot, $\frac{1}{3}$ to $\frac{1}{2}$ in. broad. The stem is slender, rather exceeding the leaves, and one to three headed; spathes rather more than $\frac{1}{2}$ in. long, mem-

branous. The flowers are without stalks, and in this feature the plant is unique in this section. The perianth-tube is $\frac{1}{2}$ in. long; limb pale lilac, an inch in length; falls obovate, $\frac{1}{3}$ to $\frac{1}{2}$ in. broad, an area of white extending a little above the crest traversed by lilac lines to margin, emarginate, with a slight crest down the haft, slightly crenate, and touched with gold; standards oblanceolate, spreading lilac only; style branches $\frac{1}{2}$ in. long; crests deltoid. It is native of Northern Japan, and if not hardy is perhaps nearly so.



IRIS MILESII

CHAPTER X

Pseudevansia

(Crested, with rudimentary beard.)

LEAVES linear.

Tube at least 2 in. long.

Leaves about 1 ft. long, $\frac{1}{2}$ in.

broad; perianth-tube 2 to

$2\frac{1}{2}$ in. long 44. I. KINGIANA.

Leaves 2 ft. long, $\frac{1}{2}$ in broad;

perianth-tube 3 in. or more

long 45. I. DUTHIEI.

Tube $\frac{1}{2}$ in. long.

Stem 5 to 6 in. long, nearly

hidden by short leaves; falls

purplish blue with dark

blotches 46. I. HOOKERIANA.

Stem 1 ft. long, bearing two to

three short leaves; falls

bright lilac 47. I. CLARKEI.

Leaves ensiform, habit of *I.*

germanica 48. I. ALBERTI.

(This species is a stranger in this group and comes into it only by a feature, which like several other parallelisms in distinct Iris sections does not indicate relationship.)

44. *I. Kingiana*, Foster in *Gard. Chron.*, 1887, i. 611; Baker in *Bot. Mag.*, t. 6957. Mr Baker describes

this as coming midway between *I. pumila* and *I. tectorum*, thus forming a connecting link between the sub-genera *Pogoniris* and *Evansia*, possessing as it does both crest and beard. The rhizome is stout and short-creeping. The leaves are five to six to a rosette, three elongated and erect, somewhat glaucous, about half a foot long at flowering time, veins and edges hyaline or translucent. The peduncle is very short; spathes one flowered, valves lanceolate, unequal, the innermost $1\frac{1}{2}$ to 2 in. long. The perianth-tube is greenish, cylindrical, 2 to $2\frac{1}{2}$ in. long; the falls obovate-cuneate, reflexing, $1\frac{1}{2}$ in. long, dark lilac or purple, much mottled or veined with paler colour, crest white and depressed, bearing white filaments with yellow tips; inner segments oblong, erect, paler lilac. The style appendages or crests are deltoid, lilac in the middle, paler towards the edge. A native of the Central Himalayas.

Mr Baker makes *I. Kingiana* the same as *I. kumaonensis*. Sir Michael Foster considers them different.

I have a note that the falls of *I. kumaonensis* are spreading, while those of *I. Kingiana* reflex.

45. *I. Duthiei*, Foster in *Gard. Chron.*, 1887, i. 611. The rhizome is knarled and knotty, with sheaths partly splitting up into fibres and bearing new young buds at their bases. While the plant is in flower the leaves are only 2 to 3 in. long, the full development not taking place until midsummer, when they attain a length of 2 ft., with breadth of $\frac{1}{2}$ in. The stem is very short, one-headed; spathe one-flowered, valves lanceolate, $1\frac{1}{2}$ in. long, keeled, and somewhat ventricose. The perianth-tube is 3 in. or more in length, falls spreading almost horizontally, lanceolate, or obovate-cuneate, reddish blue, with deeper veins and blotches, claw bearded; standards connivent, oblong-ovate, blade of red lilac, paler than the falls, and marked with deeper veins; style branches reddish lilac, crests deltoid, with crenate edge. A native

of North-East Kumaon. Flowered with Sir Michael Foster in May.

46. *I. Hookeriana*, Foster in *Gard. Chron.*, 1887, i. 611—must not be confounded with *I. Hookeri* of the Apogon section, a native of Canada. The rhizome is less fleshy than in *Pogoniris*. The leaves are linear, 6 to 8 in. long at flowering time, finally 2 ft. long, $\frac{1}{2}$ to $\frac{3}{4}$ in. broad, pale green and somewhat flimsy. Stem 5 to 6 in. long, almost wholly hidden by sheathing leaf, one-headed; spathe-valves lanceolate green. The perianth-tube is $\frac{1}{2}$ in. long, green with purple stripes, the style free within down to ovary; limb $1\frac{1}{2}$ to 2 in. long, falls $1\frac{3}{4}$ in. long by $\frac{7}{8}$ in., obovate-cuneate, purplish blue with darker blotches, the claw white with violet veins and a thick beard of yellow-tipped white hairs arising from an obscure crest; standards $\frac{3}{4}$ by $\frac{1}{2}$ in. of uniform blue-purple, narrowing suddenly into a canaliculate claw marked with red-purple veins; style branches very convex on back, crests deltoid, coarsely serrulate. Native of Lahul. Flowered with Sir Michael Foster in May.

47. *I. Clarkei*, Baker. The rhizome is stout, sheaths long, splitting into fine fibres. The leaves are linear, finally $1\frac{1}{2}$ to 2 ft. long, $\frac{1}{2}$ to $\frac{1}{2}$ in. broad. The stem is about a foot long, one or two headed, bearing two or three reduced leaves; spathes one or two flowered, $2\frac{1}{2}$ to 3 in. long; valves green lanceolate, persistent, pedicels nearly as long as the spathe. The perianth-tube is funnel-shaped, $\frac{1}{2}$ in. long, limb bright lilac, 2 in. long; falls oblong-cuneate, $\frac{3}{4}$ in. broad, with bright yellow throat and beard arising from a crest; standards with a small oblong blade and long slender claw; style branches an inch long, bright lilac, crests quadrate. Native of temperate Sikkim.

48. *I. Alberti*, Regel; *Gartenflora*, t. 999; *Bat. Mag.*, t. 7020. This is distinctly a handsome species.

The rhizome is stout, short, creeping. The leaves are ensiform, slightly glaucescent, $1\frac{1}{2}$ to 2 ft. long, over an inch in breadth. The stem is five or six headed, overtopping the leaves; spathes two or three flowered; valves ovate, ventricose, the outer scariose at flowering time except in the centre towards the base; pedicels very short. The flowers are bright lilac, perianth-tube under an inch long, narrowly funnel-shaped, greenish; falls obovate-cuneate, reflexing, two inches long, under an inch broad, faintly crested, and densely bearded with white filaments tipped with yellow, lined on each side of the beard with dull brown on a white ground; standards as long as the falls, broader, orbicular; crests of stigma short, not reaching to the top of beard. A native of the mountains of Turkestan, flowering in England towards the end of May. This plant may be accorded a treatment similar to that of *Oncocyclus*, keeping it dry after flowering, and allowing it moisture when showing desire to make new growth. *Alberti* $\times$ *balkana* is a hybrid with soft red-orange standards and rich purple falls with yellow beard.

CHAPTER XI

Oncocyclus

CUSHION IRISES

(Irises with a broad diffuse beard, stems with one flower only.)

I. LEAVES NARROW, MORE OR LESS FALCATE.

- I. Falls narrow and strap shaped
(half inch wide) with small
round blade; hairs of cushion
thick and velvety 49. I. PARADOXA.

- II. Falls and standards distinctly
narrowed to a point.
Stem 6 in. or more high; falls
and standards similar in
breadth, the former spread-
ing 50. I. EWBANKIANA.

- Stem 1 to 2 in. high; standards
twice as broad as falls, re-
flexing 51. I. ACUTILOBA.

- III. Falls and standards not narrow-
ing to a point; leaves 4 to 6
in. long, glaucous; stem rarely
exceeding 6 to 8 in.

* Colour of falls and stan-
dards somewhat the same.

- Falls and standards red-
purple, the latter much
the larger; beard trian-
gular; tube 2 in. long;
flowers sweetly scented . 52. I. BARNUMAE.

- Falls and standards yellow,
sweetly scented . . . 53. *I. URMIENSIS*.
- Falls and standards uniform
lilac; hairs of claw deep
purple; tube $1\frac{1}{2}$ in. long 54. *I. MARIAE*.
- ** Falls much veined, dark in
aspect; beard brown;
standards usually pale;
tube 1 in. long . . . 55. *I. IBERICA*.
- IV. Falls obovate-cuneate, narrow-
ing to a blunt point; colour
of flower very distinctive, con-
sisting of brownish red veins
on yellow or greenish yellow
ground; leaves about 3 in. to
a foot long, longer than the
stem; stem 1 to 6 in. high;
tube 2 in. long . . . 56. *I. LUPINA*.

II. LEAVES RELATIVELY LARGE, NOT DISTINCTLY FALCATE.

- V. Falls and standards ample and
broad; stem 10 in., 1 ft., or
more in height.

A.—Flowers wholly dark.

- * Colour of falls and standards of
nearly uniform dark purple.
Leaves and stem attaining a
foot in length; falls 3 in. $\times$
 $1\frac{1}{2}$ in.; style branches 2 in.
long . . . 57. *I. ATROPUSCA*.
Leaves 6 in. long; stems
rather less; falls 2 in. $\times$ $1\frac{1}{2}$

in.; style branches 1 in.

long 58. I. ATROPURPUREA.

- ** Falls and standards with veins and dots of black brown on creamy white ground; hairs of fall black; styles bent down

59. I. SUSIANA.

- *** Falls marked with dark brownish purple veins; standards marked with thick veins and dots of dark purple; hairs of fall yellow in median region, purple towards the sides; styles not bent down

60. I. SARI.

- **** Falls with white hairs more or less tinged with yellow; falls and standards marked with brown violet or black purple veins on a dingy white ground, which is more evident than in *Sari lurida*; tube $1\frac{1}{2}$ to 2 in. long

61. I. HEYLANDIANA.

B.—Flowers wholly light.

- Crimson spots and blue or violet veins on a white or creamy yellow ground; signal patch of concentrated crimson spots

62. I. LORTETI.

- Very thin clear veins, and minute dots of purple on creamy white ground; signal patch of purple dots; stem, $1\frac{1}{2}$ to 2 ft. high; standards 5 in. across

63. I. GATESI.

C.—Falls and standards in distinct contrast.

- Falls dark purple, almost black, nearly elliptical; standards

marked with thin dark purple
veins and dots on nearly white
ground

64. I. SOFARANA.

Falls ash grey with darker veins and
dark spot at base, orbicular;
standards sky blue with
blackish veins

65. I. BISMARKIANA.

49. I. *paradoxa*, Stev.; Regel, *Gartenflora*, t. 386, fig. 3; *Garden*, xxxii. 584; figured from Cambridge *Bot. Mag.*, t. 7081. Of distinct and desirable Irises this is one of the most strange. It is grotesquely beautiful, and clearly impresses itself in all hybrids made with it. The rhizome is short. The leaves are linear, 3 to 6 in. long at flowering time, glaucous, very falcate, $\frac{1}{4}$ in. broad. The stem is 2 to 6 in. or more in length; spathe 2 to 3 in. long; valves green, membranous, and lanceolate; pedicel very short. The perianth-tube is cylindrical, under an inch long; falls tongue-shaped, dark brown in the type, 1 to $1\frac{1}{2}$ in. long, with a very small dark purple orbicular blade $\frac{1}{2}$ in. broad, and a claw with dense velvety beard, and ground colour of crimson or deep pink. The standards are erect, white in the type, $1\frac{1}{2}$ to 2 in. broad, 2 to 3 in. long, orbicular with short claw; style branches an inch long, with small deltoid crests. This species, by its comparatively small and tongue-shaped falls, is always unmistakable. It is a native of Persia, Georgia, and the Caucasus. There are several varieties.

Standards dark violet; falls tinged with
violet.

var. *violacea*,
Baker.

Standards white, distinctly and deli-
cately veined with lilac violet.
(Figured in *Garden*, April 6th,
1901, p. 248, and in *Gard. Chron.*,
Feb. 16th, 1901, p. 104.)

var. *choschab*.

According to my experience this is the most easily grown of the *Oncocycli*. The form *choschab*, imported by Mr C. G. van Tubergen, is perhaps the typical form, which, among others, was described by Steven.

Several hybrids have been raised. "Paravar," a cross from *I. variegata*, by Sir Michael Foster, is figured in the *Gardeners' Chronicle*, June 22, 1901, and on the next page is figured the hybrid "Alkmene," raised with *I. Swerti* by Messrs Dammann & Co. Sir Michael Foster has also raised hybrids with *I. sambucina*, *I. Lorteti*, *I. iberica*, *I. lupina*, and *I. Meda*. He has combined *paradoxa*, *Korolkowi*, and *pallida*.

50. *I. Ewbankiana*, Foster in *Gard. Chron.*, 1901, June 22, p. 397, fig. 152. "A very perky little Iris," so distinct and good as to be worthy of commemorating the late Rev. H. Ewbank. It was imported by Messrs van Tubergen. The rhizome is of ordinary *Oncocyclus* type. The leaves are glaucous, linear, 6 in. long, $\frac{1}{4}$ in. wide. The stem is 10 in. high; spathe valves narrow pointed, not inflated, reaching beyond the tube, quite green till some time after flowering. The falls are spreading, without tendency to recurve, lanceolate and pointed, with thin beard of stout yellow hairs tipped with brown; the ground colour is creamy white, marked by irregular veins of brown purple colour, thicker and more jagged on the claw than on blade. The "signal" is small but conspicuous, of purple black colour. The standards are erect, ovate, lanceolate, of creamy white ground colour, veined with brown purple, a few yellow, brown-tipped hairs forming an incipient beard along the median line of claw. The style, deeply vaulted from side to side, has an upper surface of almost uniform chocolate brown, and an under surface lighter in colour, with brown purple spots on a yellowish ground. The crests are fairly large, quadrate, marked with thin, broken, brown-purple lines. The ovary is longer than the tube, which

is marked with vertical brown purple stripes. The diameter of the flower is about $3\frac{3}{4}$ in., and its height about $3\frac{1}{4}$. These and other dimensions are taken from the full-page illustration in the *Gardeners' Chronicle*, quoted above. This Iris was sent to Messrs van Tubergen by their collector from the mountain range which separates Persia from Trans-Caucasia, 120 versts to the west of Askabad.

51. *I. acutiloba*, C. A. Meyer, *Ind. Cauc.* 32; Regel, *Gartenflora*, t. 812, fig. 1. Rarely in cultivation. The rhizome is distinctly creeping. The leaves are slender, narrow, exceedingly curved, the tip bending to ground 3 to 4 in. long at flowering time, $\frac{1}{8}$ to $\frac{1}{4}$ in. broad. The stem is 1 to 2 in. high; spathe 2 in. long; valves green and membranous; pedicel very short. The perianth-tube is an inch long, limbs 2 in. long; falls oblong, 1 to $1\frac{1}{2}$ in. long, or strap-shaped with lanceolate blade, $\frac{1}{2}$ in. wide, sharply reflexing from half-way down. The standards are much larger, erect, with wavy margin twice as broad as the fall. The style branches are an inch long, the crests small and deltoid. The falls are veined with brown black on a pale brown ground. They have an irregular signal patch of deep purple, and beneath the style is densely covered with dark purple hairs; the standards paler, copiously veined. In a plant cultivated by Sir Michael Foster the body of the fall is creamy white, marked with thick purple veins and tinged towards the front of the blade with brown; the standard is creamy white, suffused with brown and marked with closely set, thin purple veins; the style is pale greenish yellow striped with rows of purple dots. The plant probably varies in colour considerably, but may always be recognised by its narrow-pointed segments, its reflexing falls, which are only half the width of standards, and by its short stem. A native of the Caucasus and mountains of Northern Persia.



IRIS PARADOXA

52. *I. Barnumae*, Foster and Baker in *Gard. Chron.*, 1888, ii. 182; *Bot. Mag.*, t. 7050. The rhizome is slender and fleshy, with the usual *Oncocyclus* character; the new buds become early separated by a constriction from the old stock, so that the growths are not massed together. The leaves are about 6 in. long by rather less than $\frac{1}{2}$ in. broad, pointed and somewhat falcate, of pale glaucous green. The stems are rather more than an inch to about 6 in. long; the spathe-valves about $2\frac{1}{2}$ in. long, rather exceeding the tube, flushed with purple at the tip, but otherwise green till long after flowering. The perianth-tube is as long as the ovary; falls obovate-cuneate, 2 in. long by 1 in. broad, with no distinction between claw and blade; the latter sharply reflexed, of dark venous red-purple with darker veins; beard triangular of fluffy hairs, which are close set, yellow tipped with purple, many hairs straggling away from the triangular outline of the mass of the beard; standards with obovate-orbicular blade about 3 in. long by $2\frac{1}{2}$ in. broad, at first gradually and at last suddenly narrowed to a short claw, on which are a few hairs the colour of lighter red purple than the falls, but with more conspicuous veins. The style branches are an inch long, nearly horizontal, made reddish by red-purple dots and a median streak on yellowish ground; the crests triangular, much recurved, finely serrate; the stigma with a serrate purple edge. The flowers are produced in May or June, and in a warm atmosphere have a delightful fragrance. It is a native of Van in Armenia, and was sent to Sir Michael Foster by Mrs Barnum, after whom it is named.

53. *I. urmiensis*, J. Hoog in *Garden*, Nov. 17, 1900, p. 375 (with fig.); *Gard. Chron.*, Nov. 24, 1900, p. 373, fig. 116. This, I believe, is a very desirable plant. It is certainly ornamental, and is remarkable in this section first on account of its self-yellow flower, and secondly,

by reason of its perfume. No strictly botanical description has yet been published and I have not seen the plant, but Mr Hoog tells us that it has the habit of *I. iberica* with similar rhizomes and is of similar height. The falls are much smaller than the standards, strongly secured, and have an orange beard but no "signal" patch. The standards are perhaps 2 in. high and nearly $1\frac{1}{2}$ in. diameter. The name *urmiensis* is given from Lake Urmiah of North-West Persia, where, in that mountainous district, the plant is native. Other Irises from the same district have naturally died down in summer, and it is hoped that this, consenting also to rest in our damp climate, may do well.

N.B.—There is a yellow variety of *I. Barnumae* which Sir Michael Foster has flowered, but it has a linear beard.

54. *I. Mariae*, Barbey; *I. Helenae*, Barbey, *Herbor. Levant*, 159. The rhizome is slender or moderately stout. The leaves are linear, 3 to 4 in. long, narrower than those of *I. iberica* and less distinctly falcate. The stem is about 6 in. long, bearing two to four short leaves, the spathes are 2 to 3 in. long; valves membranous, pale green; pedicel very short. The perianth-tube is cylindrical, greenish, $1\frac{1}{2}$ in. long; limb 2 to $2\frac{1}{2}$ in. long, of uniform lilac colour, but marked with fine veins of red-brown; the falls are orbicular-cuneate, 1 in. broad, with deep purple signal patch and hairs of deep purple on the claw crowded along the median line as if to form the ordinary Pogoniris beard. The standards are round with short claw. The style branches are 1 in. long with quadrate crests. Discovered by M. Barbey on the confines of Egypt and Palestine and was first called by him *I. Helenae*, a name previously appropriated.

55. *I. iberica*, Hoffm. *Comm.*, i. 41; *Flore des Serres*, t. 1963; *Bot. Mag.*, t. 5847; *Gartenfl.*, t. 386 and 713.



IRIS URMIENSIS

When, some years ago, this species was introduced, and perhaps the first to be exploited of this section, it created some sensation, and perhaps to-day we must consider it one of the most desirable. Certainly for hybridising it has proved valuable. The rhizome is compact and slender; the leaves linear, 3 to 6 in. long at flowering time, $\frac{1}{4}$ in. broad, glaucous and distinctly falcate. The stem is very variable in height, from 1 in. to 8 in. or more. The spathe is 2 in. long, valves green and membranous, lanceolate; pedicel very short. The perianth-tube is 1 in. long; limb 2 in. long; the falls obovate or nearly round, 2 in. long and remarkably concave. In the common form the fall is of dark brown-purple, due to thick veins and dots which almost hide the creamy white ground colour. The "signal" patch is of deep rich purple and very constant. The standards are nearly round, 2 in. broad. In colour they are very variable, sometimes white or again reddish purple, blue purple, almost red, almost blue, or stone-colour. The style arms are brown, curved sharply down so as to rest in the hollow of the fall; the crests deltoid, entire. Native of the Caucasus and the mountains of Armenia and North Persia. The following varieties have been named—

Flowers smaller than the type, pale

lilac standards, . . . var. *Perryana*,
Florist, 1873,
 25.

Falls of ochraceous brown colour, . . . var. *ochracea*,
 Regel, *Garten-
 flora*, t. 386.

Dark lilac standards, . . . var. *Bellii*,
 Baker.

Sir Michael Foster has raised several hybrids, and among them are *I. iberica* $\times$ *susiana* and *susiana* $\times$ *iberica*,

the progeny being more or less intermediate between the parents; *paradoxa* × *iberica* very handsome and more robust than either of the parents, the falls strikingly intermediate; *iberica* × *paradoxa*; *I. lupina* × *iberica*; *I. iberica* × *lupina*; *Chamaeiris* × *iberica*, the flower pleasing in the boldness of the veining and richness of the purple colour; *I. italica* × *iberica*, similar to the preceding; and *balkana* × *iberica*, charming flower with rich yellow fall heavily veined with purple, the standard light purple. The crosses with *Chamaeiris* and *italica* are not vigorous, but need no special culture.

56. *I. lupina*, Foster in *Gard. Chron.*, 1887, i. 738; *Garden*, Feb. 18, 1893, t. 897; *Bot. Mag.*, 1903, t. 7904, "Wolf's Ear." A very distinct Iris, in some respects intermediate between *I. susiana* and *I. iberica*. The rhizome is short and compact. The leaves though variable resemble those of *I. iberica*; they are light green, slightly glaucous, from 3 in. to 1 ft. in length and are about $\frac{1}{2}$ in. wide, very falcate when very short. The stem varies from 1 or 2 in. to 6 in. in length; the spathe is 3 to 3½ in. long, the valves lanceolate, ventricose, persistent and pale green; the pedicel short. The perianth-tube is cylindrical, 2 in. long; limb 3 in. long; the falls obovate-cuneate, described otherwise as lance-shaped, narrowing to a blunt but still pointed tip, 1½ in. broad; of a peculiar sombre colour brought about by irregular brownish veins on a yellow or greenish-yellow ground, the red of the veins often merging into purple. The more or less triangular "signal" patch is of dark almost black purple; the beard is of yellow hairs sometimes tipped with purple. The standards are oval, not orbicular, darker than the falls in colour,¹ and the claw is

¹ This is not in accordance with figure in the *Botanical Magazine* quoted above. A hybrid has been named between this and *paradoxa*. Messrs Barr & Sons offer a var. *Shadach*, described as robust, 15 in. high with flowers varying in shades of bronzy-yellow and brown, and bronzy-purple and sulphur.



IRIS IBERICA

furnished with quite numerous hairs. The style-arms are over 1 in. long, curved down over the falls, and the crests are semi-circular with serrated or erose edges. It is native of Armenia and Central Asia Minor.

57. *I. atrofusca*, Baker in *Gard. Chron.*, April 1, 1893, p. 384; *Garden*, Oct. 24, 1896, plate 1089; *I. atropurpurea*, var. *atrofusca*, Baker in *Bot. Mag.*, t. 7379. This, apparently, may at once be distinguished from *I. atropurpurea* by its taller stem, longer leaves, and by the greater length of the perianth-tube of the ovary, but Mr Baker now regards both as belonging to the same species. The rhizome is stout; the leaves weak, ensiform, nearly or quite 1 ft. long at flowering-time and nearly 1 in. broad; stem nearly 1 ft. long, nearly hidden by sheathing inner leaves; spathe-valves 3 to 4 in. long, pale green; ventricose, much imbricated; pedicel short and stout. The perianth-tube is cylindrical, green, 2 in. long; the falls obovate-cuneate, 3 in. long by $1\frac{1}{2}$ in. broad, nearly black with a broad cushion of velvety hairs at the base of the recurved portion and extending down the claw, where the brown-black hairs are mixed with yellow ones; the standards are orbicular, nearly 4 in. long by 3 in. broad, dark claret-brown-purple with radiating black veins; style branches 2 in. long, $\frac{1}{2}$ in. broad, very convex, acutely keeled, with large quadrate recurved crests. Is native of Palestine on the east side of the river Jordan.

58. *I. atropurpurea*, Baker in *Gard. Chron.*, Mar. 16, 1889, p. 330. Rhizome moderately stout; leaves linear glaucescent, falcate, $\frac{1}{2}$ ft. long at flowering time; stem 4 to 5 in. long; outer spathe-valves green, erect, lanceolate, 3 in. long; perianth-tube green, longer than the ovary; falls oblong cuneate, 2 in. long, $1\frac{1}{2}$ in. broad, with a short unspotted purplish-black limb having a yellow patch on claw and hind part of blade, upon which is a dense beard of yellow hairs tipped with purplish

black; standards orbicular, 3 in. long, 2 in. broad, unspotted purplish black; style branches an inch long, crests small ovate. A "signal" patch is distinguishable on the fall of black purple, but no veins are evident, while on the standard variation of deeper colour may be distinguished. Introduced from Syria by Messrs Dammann & Co., who distinguish a variety called "Odysseus."

59. *I. susiana*, Linn. Sp. Plant. 55, Curt. in *Bot. Mag.*, t. 91; *Flore des Serres*, t. 1067 to 1068. The "Mourning Iris." Of this section this species is the best known and one of the least difficult to grow. It is a curious and desirable plant. The rhizome is stout; the leaves sometimes a foot or more long and nearly an inch broad of distinctly yellowish green. The stem is from $\frac{1}{2}$ to 1 ft. long, bearing two to three long leaves; spathes exceptionally two-flowered, 3 to 4 in, valves green, ventricose, scarious towards the tip at flowering time; pedicels short. The perianth-tube is cylindrical, 1 to $1\frac{1}{8}$ in. long; limb 3 to 4 in. long, the prevailing colour a dark-grey produced by numerous veins and dots of almost black-brown, with tinge of purple on creamy white ground, which acquires a brownish hue owing to the diffusion of colour from the margins of the veins and dots. The falls are obovate-cuneate, rather longer than broad, with the hairs of beard black; the standards with orbicular blade broader than the fall; the style arms $1\frac{1}{2}$ in. long; crests very large and recurved. It is a native of Asia Minor and Persia.

I. livida, Tratt. (*Red. Lil.*, t. 18) is a variety with smaller more livid and less distinctly veined flowers.

Hybrids have been raised by Sir Michael Foster with *pallida* as male and with *iberica* both ways. The crosses were difficult to keep.

60. *I. Sari*, Schott; Baker in *Gard. Chron.*, June 17, 1876, p. 788. The type is described as follows:—



IRIS BARNUMAE

Rhizome short; leaves linear, $\frac{1}{2}$ ft. long at flowering time, finally attaining a foot, $\frac{1}{4}$ to $\frac{1}{2}$ in. broad; stem, 3 to 6 in. long; spathe of two equal lanceolate valves reaching to the base of the limb; ovary sessile (or pedicel very short) $\frac{3}{4}$ in. long; tube, 1 in. long; limb, 3 in. long, bright lilac; falls obovate-cuneate, $1\frac{1}{2}$ to 2 in. broad with a diffused beard $\frac{1}{2}$ in. broad; standards broader than the falls and a little longer, orbicular; style branches above an inch long; crests very large, reflexing.

Var. *lurida*, Boiss. *Bot. Mag.*, t. 6960. This is the plant that has been cultivated and not improbably, I think, is distinct specifically from *I. Sariii*. It has ensiform leaves $\frac{1}{2}$ in. broad, and falls which distinctly differ from the standards in colour. They are covered with very thick, irregular, netted dark brownish purple lines or veins, on a pale brownish yellow ground, which appears as a venation of that colour. The standards are somewhat lilac with veins and spots of a darker shade. The name of this species is derived from the river Sar, in Cilicia. It inhabits Asia Minor and Syria.

61. *I. Heylandiana*, Boiss. *Fl. Orient*, v. 130. The leaves are linear, glaucescent, falcate, 8 to 9 in. long, $\frac{1}{2}$ in. broad. The stem is about a foot long; the spathe-valves lanceolate, green, membranous, and 3 in. long; the pedicel short. The perianth-tube is an inch long, limb $1\frac{1}{2}$ to 2 in. long, the falls obovate-cuneate veined with brown-violet or black-purple veins on a dingy-white ground, the hairs of the beard white, more or less tinged with yellow; the standards rather broader than the falls and nearly round, are similar in coloration. The crests are short, broad, and crenulate. Is native of Mesopotamia.

62. *I. Lorteti*, Barbey, *Herbor. Levant*, t. 7; *Bot. Mag.*, t. 7251; *Garden*, Feb. 18, 1893, plate 897; *Gard. Chron.*, Aug. 6, 1892, p. 152, fig. 27. "Perhaps the most beautiful Iris in the world." In coloration it is

wonderful, but in size also it excels, a fine flower attaining a diameter of 7 in., with standards 5 in. high. The rhizome is short. The leaves are described as under a foot long at flowering time, $\frac{3}{4}$ in. broad, but when the plant is well grown they may be as large or larger than those of *I. susiana*. The stem is short; spathes 5 to 6 in. long; valves pale green, lanceolate. The perianth-tube is $1\frac{1}{2}$ in. long; limb often about 4 in. long; falls obovate-cuneate, 3 in. broad; standards orbicular, erect and inflexed. The style-branches are red-brown an inch broad with large reflexed quadrate crenate crests.

There is considerable variation of colour, but the "note" of the plant is a peculiarly charming combination of crimson spots and blue or violet veins on a white or creamy yellow ground. Sir Michael Foster describes a flower of his own production as follows:—Falls creamy yellow; ground marked with crimson spots, concentrated at the centre into a dark crimson "signal"; standards nearly pure white marked with very thin violet lines hardly visible at a distance. In the *Botanical Magazine* the standards are represented as light violet, the veins, spots and signal of the fall purple. The flower, as a rule, may be about as large or rather smaller than *I. susiana*. Native of the southern slope of the Lebanon range at an altitude of 2000 ft.

63. *I. Gatesii*, Foster in *Gard. Chron.*, July 5, 1890, ii. 18, fig. 3; *Garden*, Feb. 18, 1893, 130, plate 897. "The Prince of Irises." This wonderful species was named by Prof. Sir Michael Foster after the Rev. T. G. Gates of the American Mission at Mardin, through whose assistance Sintenis, Herr Max Leichtlin's collector, came to know of it. It comes near to *I. susiana*. The rhizome is still more compact and the foliage smaller, shorter, and narrower, and of a darker green than in *susiana*. The stem is taller, reaching a height of $1\frac{1}{2}$ or even 2 ft., and the flower also is larger, the falls being



IRIS GATESII

4 in. across, while the standards are no less than 5 in. across. The prevailing colour, Sir Michael Foster says, when the flower is seen at a distance, is a soft delicate grey brought about by very thin clear veins and minute dots or points of purple on a creamy white ground; the dots being prominent on the fall, and the veins on the standard. The spathes are 4 in. or more long, the falls orbicular reflexed. The hairs of the beard are grey or brownish, flecked with dark purple. It bifurcates in front embracing a purple patch of no great size or conspicuousness, produced by the aggregation of purple dots. The standards are ascending, nearly orbicular, and when fully expanded are concave inwards both from side to side and from top to bottom. The style-arms of yellowish ground colour, sprinkled with purple dots; the crests quadrate with finely serrated edges. A native of Armenia.

In the *Garden* of July 31, 1897, there is an illustration of a bed in Mr Van Tubergen's Nursery. There were 400 flowers out, as the result of three seasons cultivation, suggesting that the "taking-up" method of culture is sometimes very successful, especially under the circumstance of Dutch nursery soil.

64. *I. sofarana*, Foster in *Gard. Chron.*, Nov. 25, 1899, p. 389, fig. 125; *Garden*, Dec. 16, 1899, p. 486. The author of the name, from whose description the following points are taken, says that this is a handsome Iris, well worth cultivating. It comes nearest to *I. Sari*. It was collected for Messrs Van Tubergen on the Lebanon, at a considerable altitude, near Ain Sofar. The rhizome is large and compact, and the leaves relatively broad, 10 in. long by nearly an inch, so broad as to suggest an ordinary bearded Iris. The stem is about 10 in. high and the spathe-valves are very long and narrow. The falls are nearly elliptical, of dark purple almost black colour brought about by very thick set

reticulate blotched veins of dark purple colour on a creamy-white ground, very little of which is visible; the beard is straggling, of scattered long dark purple hairs, and in front of these the netted veins are fused into a distinct "signal." The standards are almost orbicular with ground work nearly white, marked with thin dark purple veins, most conspicuous near the margin, interspersed all over with dark purple dots; about a dozen dark purple, almost black, long hairs are scattered over the claw. The style-arms are horizontal, broad, dark purple, almost black, with large quadrate crenated crests, marked with branching blotched purple veins on a yellow ground. A variety supposed to be finer than the type has been distributed during the last year or two under the name *magnifica*.

65. *I. Bismarkiana*, Hort; Dammann, *Wein Gartenzeit*, 1892, 355, fig. 72. This is a little known plant from the Lebanon introduced by Messrs Dammann & Co., the well-known enterprising nurserymen of San Giovanni a Teduccio, near Naples. Mr Baker says of it as follows:—Habit of *I. susiana*; leaves ensiform, glaucous-green, 8 in. long. Stem above a foot long. Flowers as large as in *susiana*, falls orbicular, ash grey with darker veins and a dark spot at the base, standards sky-blue with blackish veins.

It is believed by Sir Michael Foster that a plant which seems fairly common in Palestine, called by him *I. Sari* var. *nazarena* (*Garden*, Feb. 18, 1893, p. 133), is the same as this. Mr Baker's description may therefore be extended by drawing on Sir Michael's as follows:—Rhizome creeping to a marked extent sending out long thin stolon-like shoots many inches in length. Falls obovate with blade convex from side to side, ground straw-colour, marked with an irregular network of dark reddish purple, brown veins, formed of rows of spots or blotches running into each other; in front of the end of



IRIS SOFARANA MAGNIFICA



the style a well defined heart-shaped signal-patch of intense, almost black crimson or red purple; beneath the style a beard of not very numerous, dark purple, almost black hairs, disposed chiefly on each side of the middle line, leaving a bare median streak. The standard orbicular or nearly so, with a bluntly serrate edge, marked with thin blue veins on a creamy white ground, without spots or dots, though on the claw the veins become blotched as they assume a red-brown-purple colour. Style horizontal or even inclined upwards, somewhat narrow, marked with numerous reddish brown spots or blotches on a creamy white ground; the crests deltoid, divergent, with finely serrate edge. In this species Sir Michael Foster has observed the rudiment of a second flower within the spathe-valves. It is striking and handsome, though inferior in beauty to *Lorteti*, *Gatesii* or *iberica*.

Mem.—In catalogues I find *I. Eggeri* described as having beautifully shaped flowers of dark brown colour, and *I. nigricans* described as a new species from the Holy Land, with large flowers of brilliant black-brown, but I have failed to find any sufficient description of either. The same must be said for *I. Manissadjani*, which is described as like *I. lupina* dwarf and small, and *I. demawendica*, offered by Messrs Barr & Sons, who describe it as a grand new Cushion Iris from Mount Demawend, with flowers much larger than *I. iberica*, and of handsome claret red colour. It flowers in May. Another new species is *I. Haynei*, said to be of remarkable beauty. Mr Perry of Winchmore Hill offers *I. Christmanni*, which he describes as a new *Oncocyclus* of dwarf habit and very free flowering, the flowers being large, standards of rose colour beautifully lined with yellow, falls yellow, heavily lined with crimson, and having a large crimson blotch.

CHAPTER XII

Regelia.¹

(Allied to *Oncocylus*, but segments narrower pointed, and each usually with a linear beard.)

Leaves ensiform.

Tube $1\frac{1}{2}$ in. long, falls and standards with wavy margin, colours blue, white, rose and brown; crests obtuse, rhizome wide creeping 66. I. LEICHTLINI

Tube 1 in. long, falls and standards with very even margins, colours pale yellow with dark blotch on falls, or purple; crests pointed, rhizome short creeping 67. I. KOROLKOWI

Leaves linear.

Tube $\frac{3}{4}$ to 1 in. long, stem with two to three reduced leaves, falls larger than standards, both conspicuously veined with lines of claret purple on greenish yellow ground 68. I. SUWAROWI

N.B.—I. Barnumae, with linear leaves, the flowers red-purple and standards much larger than the falls, I place under *Oncocylus*.

66. I. Leichtlini, Regel, *Descr.*, ix. 40; *The Garden*,

¹ After Dr Regel, formerly Director of the Botanic Garden, St Petersburg.

1897, Sept. 18, plate 1136; *Bot. Mag.*, 1902, t. 7861. *I. vaga*, Foster; Regel, *Gartenflora*, t. 1247, fig. 7. While many Irises have larger flowers than this, few can vie with it for peculiar yet beautiful coloration. It is most distinct and select. The rhizome is slender and the leaf-tufts are non-contiguous. The leaves are ensiform, scarcely glaucous, 1 to 1½ ft. long, ½ in. broad. The stems are 1½ ft. long, one-headed, bearing about two reduced leaves; spathes two to three flowered, 2½ in. long; valves oblong, lanceolate, green, with a scarious top at flowering time; pedicel short. The perianth-tube is cylindrical, 1½ in. long; the limb 2 to 2½ in. long, combining the colours blue, white, rose and chocolate; falls with an oblong blade an inch broad, as long as the broad claw; beard dense, lavender white; standards as broad as the falls oblong, the claw distinctly bearded; style branches an inch long, crests broad, obtuse.

I. vaga should perhaps be distinguished as a variety. As sent to me it is very similar, but smaller. Both were found by Albert von Regel in the mountainous districts of Turkestan. Similar cultivation to that of the *Oncocyclus* section is required. Herr Max Leichtlin says it is perfectly hardy, requires a loamy soil and dry situation, and is best left alone for several years.

67. *I. Korolkowi*, Regel, *Enum. Turkest.*, 32; *Gartenflora*, t. 766; Baker in *Bot. Mag.*, t. 7025. I have regarded this, in one or two of its forms, as the most beautiful Iris I know. It has proved one of the most valuable in hybridising, especially in conjunction with the *Oncocyclus*, and the great advantage has been attained of combining the great size and character of the *Oncocyclus* with the quality of easy cultivation. Moreover, in the hybrids there are two flowers to each stem instead of one. Sir Michael Foster has had splendid results, and Mr C. G. Van Tubergen has done a great service in

raising beautiful novelties for distribution (see chapter on "Hybrids and Hybridising"). The rhizome of *I. Korolkowi* is short-creeping; the leaves are ensiform, glaucous, about a foot long at flowering time, and an inch broad. The stem is one-headed, about a foot long, bearing a single reduced leaf about the middle; the spathe is usually two-flowered, 3 to 4 in. long, the outer valves very large, oblong, lanceolate; membranous, green, lanceolate and ventricose; pedicel short. The perianth-tube is an inch long, cylindrical; limb $2\frac{1}{2}$ to 3 in. long, of pale yellowish white veined with chocolate; the fall having a "signal" patch and beard of the same colour; the blade of the fall is oblong, an inch broad; the standards are oblong, erect, as long and broad as the falls; the style arms are an inch long; the crests large, ovate-deltoid. The ovary is linear-oblong, strongly angled, above an inch long, and the capsule oblong, unequally hexagonal, $1\frac{1}{2}$ to 2 in. long, narrowed to a point. Is native of Turkestan, and was sent to St Petersburg by General Korolkow in 1872.

A comprehensive article on this Iris by Sir Michael Foster will be found in the *Gardeners' Chronicle*, July 14, 1888, p. 36. He distinguishes four varieties:—

Var. **Leichtlini**, falls and standards nearly pure creamy white with tender, unobtrusive veins, "signal" almost black-purple.

Var. **venosa**, falls and standards pale lilac-grey with conspicuous purple venation.

Var. **violacea**, falls and standards violet or puce.

Var. **concolor**, segments broader and more obtuse venation, almost obscured by the violet or purple colour. This is figured in *Bot. Mag.* as quoted above.

The type is here described as having relatively narrow falls, of general olive-green colour, caused by olive-green-brown veins and a like coloured "signal," on a



IRIS KOROLKOWI



creamy white ground, which has a greenish tinge. It is figured in the *Gartenflora* as quoted above, and I think the form taken as type in the *Botanical Magazine* must be the same.

Sir Michael Foster recommends a gritty and sandy, but stiff loam, and says that he covers his plants with a temporary light in June and July in order to provide the requisite roasting. I grew it on a south border for some years, but the plant was outside the lights covering the allies, and therefore, perhaps, finally disappeared.

68. *I. Suwarowi*, Regel, *Descr. Pl. Nov.*, x. 45; Baker in *Bot. Mag.*, t. 7029. *I. lineata*, Foster; Regel, *Gartenflora*, t. 1244, figs. 1-6. Though not beautiful, this plant is interesting and attractive. The rhizome is short creeping; leaves thin, linear, pale green, above a foot long at flowering time, $\frac{1}{4}$ in. broad. The stem is one-headed, about a foot long, with two to three reduced leaves; spathes two-flowered, $2\frac{1}{2}$ to 3 in. long; valves lanceolate, green, membranous, ventricose; pedicel short. The perianth-tube is cylindrical, $\frac{3}{4}$ to 1 in. long; limb 2 in. long, all segments finely and closely veined all over with claret-purple on a pale greenish ground; falls oblong, lanceolate, sub-acute, $\frac{1}{2}$ in. broad, with a violet-blue beard; standards as long, oblanceolate, the claw sometimes faintly bearded; style branches an inch long; crests crenate. A native of Turkestan. *I. lineata*, quoted above, is identical. Cultivation is the same as for the preceding of this section.

CHAPTER XIII

Pogoniris.

(Bearded Irises the rootstock rhizomatous.)

A.—Dwarf, with early fugitive flowers.

- I. Spathes two-valved, one-flowered . . . Group PUMILAE, p. 121.
- II. Spathes with more than two valves, scape rarely more than $1\frac{1}{2}$ ft. high; one to three flowered . . . Group BIFLORAE, p. 125.

B.—Tall, often, but not always, with deeply forked stems.

- III. Spathes green (*Cengialti* is an exception), and peduncles scarcely overtopping the leaves . . . Group VARIEGATAE, p. 135.
- IV. Spathes nearly all green at flowering time, peduncles overtopping the leaves . . . Group GERMANICAE, p. 140.
- V. Spathes nearly all membranous at flowering time, peduncles overtopping the leaves . . . Group PALLIDAE, p. 149.

C.

- VI. Tall, with stems not
forked, leaves long and
narrow CHRYSANTHA, p. 152.

The above groups, except C.—VI., are those made
and defined by Mr Baker.

I. Pumilae.

- Tube more than an inch long.
Leaves linear, 2 to 4 in.
long at flowering
time; stem very
short; flowers not
usually fragrant . 69. I. PUMILA.
- Leaves ensiform, 6 to 9
in. long at flowering
time; stem to 6 or 8
in.; colour yellow to
bright lilac . . . 70. I. PSEUDO-PUMILA.
- Leaves ensiform, attain-
ing a foot; stems 3
to 5 in. long; flowers
very fragrant; colour
greenish yellow; falls
with central patch of
lilac-blue and a yellow
beard 71. I. SUAVEOLENS.
- Tube an inch or less in length.
Leaves ensiform, stem
very short; flowers
bright yellow . . . 72. I. CHAMAEIRIS.
- Leaves ensiform; flowers
dark violet; tube twice

as long as ovary; leaves
 $\frac{1}{4}$ to $\frac{3}{8}$ in. wide, shorter
 than stem . . .

— var. ITALICA.

Leaves ensiform, $\frac{1}{2}$ or $\frac{5}{8}$
 in. wide; stem up to
 6 or 9 in. long, equal
 with leaves; flowers
 dark violet; tube
 slightly longer than
 ovary . . .

— var. OLBIIENSIS.

Leaves linear, $\frac{1}{8}$ in.
 broad; falls greenish
 yellow, with a brown
 centre¹ . . .

73. I. MEDA.

69. *I. pumila*, Linn. Sp. Plant.; Curt. in *Bot. Mag.*, t. 9; *Red. Lil.*, t. 261; Reich. *lc. Fl. Germ.*, t. 327, fig. 752; *I. Clusiana*, t. 328, fig. 755. Of early flowering Irises this is one of the most acceptable, especially, I think, in the variety *caerulea* (see accompanying plate). Some other dwarf Irises are frequently grown under this name, but the very short stem and long perianth-tube of *I. pumila* readily distinguish it. The rhizome is short and stout. The leaves at flowering time are 2 to 4 in. long, $\frac{1}{4}$ to $\frac{1}{2}$ in. wide, slightly glaucous. The stem is obsolete or very short, one-headed; the spathe one-flowered, $1\frac{1}{2}$ to 2 in. long; valves lanceolate, scarious towards the tip at flowering time; pedicel, none or very short. The flowers are described as not fragrant, but this they certainly are sometimes. The perianth-tube is green, slender, 2 to $2\frac{1}{2}$ in. long; limb $1\frac{1}{2}$ to 2 in. long, yellow or dark lilac, or almost caerulean blue; falls oblong-cuneate, $\frac{3}{4}$ in. broad, reflexing from half-way down, densely bearded; standards as long, oblong; the same breadth as the falls; style

¹ Apart from the narrow beard, on account of which, for facility of reference, I place this Iris in this group, it is an *Oncocyclus*.



IRIS PUMILA CERULEA

branches an inch long, crests lanceolate-deltoid. Is native of Central and South-Eastern Europe, from Austria and the Caucasus to Asia Minor.

The following varieties may be distinguished :—

Leaves narrow, falcate, flowers pale yellow with the divisions veined with brown-lilac on the claw.

Var. *attica* (Boiss. et Held.), Regel, *Gartenfl.*, t. 377, fig. 2.

Flowers bright blue, tube $1\frac{1}{2}$ in. long.

Var. *caerulea* (Spach), *Bot. Mag.*, t. 1261.

Limb, lilac or yellow, $1\frac{1}{2}$ in. long, divisions $\frac{1}{2}$ in. broad, tube same length as limb.

Var. *stenoloba* (Herb. D. C.), Moldavia.

Short stem, narrower lilac or yellow segments and larger stigmatic crests.

Var. *aequiloba* (Led.), Crimea.

At Kew, I have recently noticed a form of the var. *caerulea* named Count Andrassy, apparently of stronger growth. There are numerous variations of the species. In the Kew hand-list of herbaceous plants is a var. *bicolor* and a var. *gracilis*.

I am not aware of any special culture for this not very free growing species, but a well drained border of good soil in sunny position must be recommended.

70. *I. pseudo-pumila*, Tineo, *Cat. Hort. Panorm.*, 1827, 28; *I. panormitana*, Tod. This is not commonly cultivated. The rhizome is short, as thick as a man's finger. The leaves are ensiform, 6 to 9 in. long at flowering time, $\frac{1}{2}$ to $\frac{3}{4}$ in. broad, suddenly narrowed to an oblique tip. The stem is one-headed, 6 to 8 in. long; the spathes one-flowered, 3 in. long, quite hidden by the sheathing leaves; valves lanceolate, membranous, green, rather ventricose; pedicels short. The perianth-tube is 2 to $2\frac{1}{2}$ in. long; limb varying from yellow to bright lilac, 2 to $2\frac{1}{2}$ in. long; falls oblong, unguiculate, $\frac{3}{4}$ in. broad, reflexing from half way down, bearded down

the haft; standards rather broader, oblong; style branches an inch long, crests lanceolate-deltoid, $\frac{1}{2}$ in. long. A native of the mountains of Sicily, flowering from March to May.

71. *I. suaveolens*, Boiss, *Diag.*, xiii. 15. Stem 3 to 5 in. long, one-flowered. Leaves ensiform, overtopping the flower, finally a foot long; spathe of two little-inflated, green, acutely keeled lanceolate valves. Flowers greenish yellow, very fragrant, tube $\frac{1}{2}$ longer than limb; falls oblong-cuneate, with a central patch of lilac-blue and a yellow beard; standards rather broader and crisped at the edge; crests lanceolate, toothed on the outer edge. Native of the plains of Bulgaria.

72. *I. Chamaeiris*, Bertol. *Fl. Ital.*, iii. 609; *I. pumila*, Linn. *Herb.*; *I. lutescens*, Red. *Lil.*, t. 263. This, in one or other of its several forms, is common in gardens and is often comfounded with *I. pumila*, as apparently it was by Linneus, but the perianth-tube is only an inch long. The rhizome is stout and short creeping. The leaves are ensiform, pale green, 3 to 4 in. long at flowering time, $\frac{1}{4}$ to $\frac{1}{2}$ in. broad. The stem is usually very short—in var. *albiensis*, sometimes 6 to 9 in. long—one-headed; spathe one-flowered, $1\frac{1}{2}$ to 2 in. long; valves lanceolate, ventricose, entirely green or scarious towards the tip at flowering time; pedicel very short. The flowers are not fragrant; the perianth-tube is about an inch long, funnel-shaped in the upper half, limb bright yellow in the type; falls obovate-cuneate, an inch broad, with a dense yellow beard, the haft tinged and veined with brown; standards as long and broad, oblong; style branches an inch long, crests deltoid. Is native of North Italy and the south of France to Dalmatia and the Banat.

Varieties.

Stature and foliage of type, limb dark violet.

var. *italica*, Parl, *Fl. Ital.* iii., 185.

Leaves broader, flowers dark violet, and stem sometimes 6 to 9 in. long.

var. *olbiensis*, Henon in *Ann. Soc. Agric. Lyon*, viii. 462; Hook., *Bot. Mag.*, t. 6110.

This var. *olbiensis* likes damp soil.

73. *I. Meda*, Stapf, *Bot. Polak*, 20; Baker in *Bot. Mag.*, t. 7040 (does not agree with authentic description). While the beard of an *Iris* is very useful for purposes of classification, it is not an absolute guide to affinity. In general habit, rhizome, capsule, and seed, this, as Sir Michael Foster points out, is an *Oncocyclus*, but I keep it here for the sake of simplicity in arrangement. The rhizome is small, slender, and compact, the leaves linear, glaucous, for the most part erect, not falcate, narrower than in *I. iberica*. The stem may be 6 in. long, but is variable. The perianth-tube is under an inch long. The fall is narrowly elliptical, pointed, spreading horizontally, but the blade reflexed on itself, greenish yellow in colour, marked with thick purple veins; the beard is linear, thick with orange-coloured hairs, continued in front of the style, and ending against an oval, well-defined, "signal" patch of deep, almost black purple. The standards are elliptical, rather larger than the fall, greenish-yellow veined with brown. The style is narrow, ending in two small triangular crests; it is marked with rows of brownish dots. The flowers are sweetly scented in some plants, a rare feature in *Oncocyclus*. It is a native of Persia, and requires the treatment of the *Oncocyclus* section.

II. Biflorae.

A. Leaves linear, flowers yellow.

Rhizome wide creeping;
leaf-sheaths not split into

fibres; crests lanceolate 74. *I. ARENARIA*

Rhizome short creeping;
 sheaths splitting into
 fibres; crests deltoid;
 stem 1 to 6 in. long;
 limb of perianth 1 to
 1½ in. long

75. *I. FLAVISSIMA*

Stem longer and flowers
 larger

var. *BLODOVII*

B. Leaves ensiform; flowers
 yellow, lilac, or purple.

For *I. mandschurica*,
 see p. 195.

* Leaves 2 to 4 in. long at
 flowering time; stemless,
 ovary quite sessile

76. *I. RUBROMARGINATA*

† Stem 3 to 4 in. long;
 ovary shortly stalked;
 perianth-tube 2 in. long

77. *I. MELITTA*

Perianth-tube 1 in. long

78. *I. STRAUSSII*

†† Stem 6 to 9 in. long;
 perianth-tube 1 in. long

79. *I. BALKANA*

** Leaves 6 to 12 in. long
 at flowering time.

† Standards long and
 narrowly cuneate;
 spathe-valves finally
 diverging and expos-
 ing the ovary

80. *I. EULEFELDI*

†† Standards obovate to
 nearly round.

§ Flowers purple.

Falls 1½ in. broad;
 beard white, tipped
 with yellow; valves
 entirely scarious

81. *I. ATROVIOLACEA*

Falls 1 in. broad;

beard bright yellow;
valves green or sub-
scarious 82. *I. BIFLORA*

Falls under an inch
broad; valves en-
tirely scarious 83. *I. BURNATI*

§§ Flowers yellow.

a. Leaves 6 to 9 in. or a foot
long, $\frac{3}{4}$ to $1\frac{1}{2}$ in. broad,
pointed.

Style branches
an inch long; crests
lanceolate, deltoid,
acute; colour of
flower pale yellow 84. *I. VIRESCENS*

Style branches
above an inch long;
crests small; stan-
dards as long and
broad as falls 85. *I. REICHENBACHIANA*

Style branches
above an inch long;
crests sub-quadr-
ate or broadly
ovate; standards
broader than the
obovate - cuneate
falls 86. *I. LUTESCENS*

b. Leaves 6 to 8 in. long, 1
in. broad, conspicuously
obtuse 87. *I. OBTUSIFOLIA*

N.B.—For *I. Statellae*, see under *I. lutescens*.

74. *I. arenaria*, Waldst. and Kit.; *Red. Lil.*, t. 296;
Lindl. in *Bot. Reg.*, t. 549; Reich, *Lc. Fl. Germ.*, t.
330, fig. 757. So distinct is this plant that it forms the
section *Psammiris* of Spach. It grows in dry sand, and

green, the pedicel hardly exceeding $\frac{1}{2}$ in. The tube is 1 in. long, slender, narrowing to the base. The falls are 2 in. long, obovate-cuneate, the beard composed of dense white hairs tipped with violet. In colour the flower is dull purple, the falls lighter below, with thickish purple veins; the blade is distinctly veined (when dry) like an insect's wing, the veins being fine and clear. The standards are obovate, oblong, narrowed below to a short claw; the lower part of the blade is light in colour, and the purple of the blade above is here continued in very small spots. The style-arms are between 1 in. and $1\frac{1}{4}$ in. long, including the crests; together the crests are semicircular, and are distinctly toothed. The plant is a native of Persia, and appears to be easily grown.

The above description is from a plant cultivated at Kew, but since writing it I am informed by eminent authority that *I. Straussii* is only *I. melitta*. This plant, however, appears to differ from the description of that plant, and as I am unable to give it another name, I leave it with that used at Kew.

79. *I. balkana*, Janka, *Adat. Erd.*, 173. Rhizome stout. Leaves in crowded tufts, ensiform, 6 to 9 in. long at flowering time, $\frac{3}{4}$ in. wide, glaucescent; stem one-headed, 5 in. long (Baker says 6 to 9 in. long); spathes of two lanceolate valves, one or two flowered, 2 in. long; pedicel short. The perianth-tube is 1 to $1\frac{1}{4}$ in. long, limb $2\frac{1}{2}$ in. long, of red-purple colour; the falls are obovate-cuneate, $1\frac{1}{2}$ in. wide, reflexing from low down; the beard dense, of white hairs, described by Baker as tipped with lilac; standards of same length and width, oblong; the style-arms are $1\frac{3}{4}$ in. long, including the crests, which are deltoid in shape. Is a native of the Balkans, and flowers in May. There appears to be no difficulty in growing this, and I have seen it doing well on a bank with other dwarf Irises.

Sir Michael Foster has raised a hybrid with *I. Cengialti*, known as "Balceng." *I. balkana* is the female parent.

80. *I. Eulefeldi*, Regel, *Gartenflora*, vol. xxvii. (1878), p. 324, t. 954; *Bot. Mag.*, t. 6902 (1886). This is a very fine and distinct plant, but a shy flowerer. The rhizome is stout, of the usual *Pogoniris* character. The leaves are five or six to a cluster, 1 ft. or more long, and 1 in. or more broad, so remarkably of glaucous grey-green colour as to be quite distinct in this respect from other *Irises* in cultivation. The stem is about 1 ft. high, with a sheathing leaf half way up, and bearing two flowers at the top. The spathe-valves are 2 in. long and $\frac{5}{8}$ in. wide, pale green at first, finally colourless and diverging, exposing the ovary. The perianth-tube is thick, of red-purple colour, twice as long as the ovary; the falls obovate-cuneate, recurved to near the base; the colour of the blade is lilac or pale purple, with purple veins; below the veins are brownish on lighter ground; the beard reaches into the blade, the hairs white-tipped with blue-purple; the standards are erect-connivent, cuneate-spathulate; veins thickish and red-brown on the yellow claw, redder on the blade, with blue-purple prolongations of peculiar hue towards the margin. The style-arms are blue-purple, rather elevated above the beard; crests oblong, toothed on the outer edge. The pollen is scanty, of blue colour. A native of Eastern Turkestan, on mountains near Siudun, at an elevation of 5000 to 6000 ft. It requires the treatment of *Onocyclus*, but is less difficult to grow. Was figured from the Cambridge Botanic Garden.

81. *I. atrovioacea*, Lange in *Bot. Tids.*, 1882, 18. The rhizome is short creeping and stout. The leaves are ensiform, very glaucous, a foot long at flowering time, $\frac{3}{4}$ to 1 in. broad. The stem is one-headed, about as long as the leaves; spathes two to three flowered;

the valves oblong, ventricose, 1 to $1\frac{1}{2}$ in. long, entirely scariose at flowering time; pedicel very short. The flowers are dark violet and fragrant; the perianth-tube under an inch long; falls obovate-cuneate, 3 in. long, $1\frac{1}{2}$ in. broad; beard white, tipped with yellow; standards as long as the falls, orbicular, 2 in. broad; style arms above an inch long, the crests deltoid. This, Mr Baker thinks, is a hybrid between *I. Chamæiris* and *I. pallida*. It flowers late in May, and is known only in cultivation. Cultivation is the same as for the majority of the Pogoniris section.

82. *I. biflora*, Linn. *Sp. Plant.*, 56; *I. subbiflora*, Brot. *Fl. Lusit.*, t. 98; *I. fragrans*, Salisb.; *I. nudicaulis*, Bot. Mag., t. 5806, non-Lam. The rhizome is stout, short creeping. The leaves are ensiform, glaucous, and at flowering time 6 to 9 in. long, $\frac{1}{2}$ to $\frac{3}{4}$ in. broad. The stem is one-headed, $\frac{1}{2}$ to 1 ft. long; the spathes two-flowered, 2 to $2\frac{1}{2}$ in. long; valves oblong, green or subscariose at flowering time, ventricose; pedicel very short. The perianth-tube is an inch long, the limb of bright violet purple, 2 to $2\frac{1}{2}$ in. long; falls obovate-cuneate, an inch broad, the beard bright yellow; standards orbicular, $1\frac{1}{4}$ to $1\frac{1}{2}$ in. broad; style branches over an inch long, crests deltoid. A native of Portugal and Morocco, flowering in April. The flowers are fragrant. Is of easy culture.

The plant called *I. biflora gracilis* is probably a cross between *virescens* and *nudicaulis*.

83. *I. Burnati*, Baker. The rhizome is stout, leaves ensiform, above a foot long at flowering time, $\frac{3}{4}$ in. broad. The stem is one-headed, 1 to 2 ft. long, bearing about two reduced leaves; spathes two-flowered, 2 in. long, the valves oblong, entirely scariose at flowering time; pedicel short. The perianth-tube is an inch long, funnel-shaped in the upper half; limb $2\frac{1}{2}$ in. long, bright violet purple; falls obovate-cuneate, under an inch

broad, densely bearded; standards as long, oblong, an inch broad; style branches an inch long, crests deltoid. Is native of the Maritime Alps, growing on rocks below Eza.

84. *I. virescens*, D. C. in *Red. Lil.*, t. 925. Rhizome stout, short creeping. Leaves ensiform, slightly glaucous, 8 to 9 in. long at flowering time, $\frac{1}{2}$ to $\frac{3}{4}$ in. broad. Stem one-headed, 9 to 12 in. long, bearing about two reduced leaves; spathes one to two flowered, 2 to $2\frac{1}{2}$ in. long; valves oblong, ventricose, membranous, green, with a scariose edge and tip at flowering time; pedicel very short. The perianth-tube is about an inch long; limb, 2 to $2\frac{1}{2}$ in. long; falls obovate-cuneate, $\frac{3}{4}$ to 1 in. broad, greenish yellow, veined on the haft with dull purple; beard bright yellow; standards as long and broad, obovate, dull yellow; style branches an inch long; crests lanceolate, deltoid, acute, serrulate. A native of Valais, near Sion. The flowers are fugitive, appearing at the end of April. Ordinary cultivation is all it requires.

85. *I. Reichenbachiana*, Henff. *Oester. Bot. Zeit.*, 1858, 28. The rhizome is short and stout. The leaves are ensiform, 6 to 8 in. long at flowering time, $\frac{3}{4}$ in. broad. The stem is slender, one-headed, nearly a foot long; spathe very ventricose, 2 in. long, the valves oblong, subscariose at flowering time. The flowers are bright pale yellow; the tube reaches to the top of spathe; the limb is 2 in. long; the falls are obovate, about an inch long, with bright yellow beard; standards as long and as broad as the falls; the style arms an inch long; crests small. Is native of Servia, and flowers in this country in May. An ally of *lutescens*.

86. *I. lutescens*, Lam. *Encyc.*, iii. 297; *Bot. Mag.*, t. 2861; Reich. *lc. Germ.*, t. 329, fig. 756. This is a handsome, easily grown Iris, and in the variety *Statellae* is exceedingly pretty and charming. The rhizome is

stout; the leaves are variable, from 6 in. to a foot long and up to $1\frac{1}{2}$ in. broad, falcate, narrowed to an acute point and slightly glaucous. The stems are from 6 to 12 in. long, usually one-headed, but occasionally with a side flower below; valves oblong, lanceolate, $2\frac{1}{2}$ to 3 in. long, green, but scariose towards the top, the upper sometimes spreading so as to expose the ovary. The perianth-tube is greenish, an inch long; limb 3 in. long; the falls obovate, with a bright yellow beard, the blade veined with pale, inconspicuous purple below and upwards stroked with the same colour; the standards are as long, but broader, narrowed to the claw; the style arms are over an inch long, $\frac{5}{8}$ in. broad, ovate, the stigmatic lip rounded.

I. erratica, Tod., may be recognised as a variety and not identical by the leaves which cut three to the stem instead of one, and by the stigmatic lip which, for a portion, is straight across and not rounded as in the type. The flower is of paler colour than the type, and is without purple strokes on the blade of fall. It is not a wild plant, but appeared as a seedling in the Palermo Botanic Garden.

Var. *Statellae*, Tod., Baker in *Bot. Mag.*, t. 6894, may be recognised by its pale yellow, almost white colour, by its flowering rather earlier than the type, and by the stigmatic lip, which is distinctly straight across. The style arms further are narrower than in the type. The late flowers at least are smaller than those of the type, and the tube may be under an inch long. I learn on very good authority that this variety, like the last, appeared in the Palermo Botanic Garden as a seedling. Both may be of hybrid origin.

All these are easily grown, and particularly I recommend the type and the var. *Statellae*. The three seem to form a gradation.

87. *I. obtusifolia*, Baker in *Bot. Mag.*, 1900, t. 7701. A number of Irises are strongly marked by a single



IRIS STELLATAE

feature, and this may be recognised at once by its very obtuse leaves. The rootstock is robust and shortly creeping. The leaves are pale green, ligulate, obtuse, the largest 6 to 8 in. long at flowering time, and 1 in. broad. The stem is a foot long, bearing one terminal head and one sessile cluster below; the spathe-valves are oblong, very ventricose, 2 to 3 in. long, pale green at flowering time; pedicels very short. The perianth-tube is short, limb sulphur yellow; falls obovate-cuneate, 2 in. long, by an inch broad above the middle; beard orange yellow; standards as long as the falls, cordate orbicular, with short, narrow claw; style branches pale yellow, an inch long; crests deltoid, irregularly toothed on the outer edge. This very distinct species was discovered by the late Lieutenant-Colonel Henry Lake Wells in the Province of Mazanderan, on the south of the Caspian Sea, and by him was sent to Kew. It grows there on a south border, apparently doing well.

III. Variegatae.

Tube short, $\frac{1}{4}$ to $\frac{1}{2}$ in. long.

Flowers bright lilac; valves
scarious, beard yellow . 88. I. CENGIALTI

Tube $\frac{3}{4}$ to 1 in. long.

Middle of falls veined with
brown on yellow ground;
standards yellow . 89. I. VARIEGATA

Flowers usually deep lilac;
valves tinged with purple;
beard white. Flowers in
April and May . 90. I. APHYLLA

Flowers of dull purple, lower
haft of falls veined with dead
purple on a yellow ground;
beard yellow; elder scented 91. I. LURIDA

- Flowers dark violet, valves tinged with purple; beard yellow white; haft of falls veined with brown violet; capsule cylindrical. Flowers in April and May . . . 92. *I. BENACENCIS*
- Flowers dark violet, outer valves only green; beard yellow; haft of falls veined with brown; capsule trigonous 93. *I. KOCHI*

88. *I. Cengialti*, Ambrosi, *Fl. Tyrol.*, i. 643; Foster in *Gard. Chron.*, 1886, May 1, p. 554. A very charming Iris, an ally of *I. pallida*, but dwarf, with deep sky blue flowers, flushed with purple; the falls long, and, I think, prettily swayed by slight breezes. The rhizome is stout and short creeping. The leaves are ensiform, yellowish green, glaucous, $\frac{1}{2}$ ft. long or more at flowering time, and $\frac{1}{2}$ in. broad, completely dying down during winter. The stems rather exceed the leaves, and are one to three headed; the spathes two-flowered, about an inch long, scariosc while the flowers are still in bud; pedicels obsolete or very short. The perianth-tube is $\frac{1}{4}$ to $\frac{1}{2}$ in. long, limb 2 in. long; falls obovate-cuneate, 1 to $1\frac{1}{4}$ in. broad; beard thick with stunted orange-tipped hairs; standards as long and as broad; style branches an inch long, of blue, like the falls and standards, but paler; crests deltoid, denticulate. Gathered on Monte Cengialto.

Var. *Loppio*, Foster in *Gard. Chron.*, 1886, May 1, p. 554. This variety was gathered by Sir Michael Foster on the northern slopes of Monte Baldo, overlooking the lake of Loppio. It is quite distinct from the above, and, though good, has not the same choice appearance. In the Cambridge Botanic Garden the

leaves are 18 in. long, an inch wide, falcate, and of bluish green colour. They die down in winter. The stems are slightly longer. The spathe valves are very membranous, and so soon scariose that the plant looks as if it had suffered in some way. The flowers are dark purplish blue, the perianth tube hardly $\frac{1}{4}$ in. long; falls obovate-cuneate, 3 in. long and $1\frac{1}{2}$ in. wide; beard dense with white orange-tipped hairs. The standards are $2\frac{1}{2}$ in. long, $1\frac{1}{2}$ in. wide, lighter in colour than the falls; style arms, including the crests, $1\frac{1}{4}$ in. long, the crests deltoid denticulate.

These plants, in spite of their place in this group for convenience, are closely allied to *I. pallida*. They differ in having a very short perianth-tube, and this distinguishes them also from the following *Variegatae*.

89. *I. variegata*, Linn.; Curt. Bot. Mag., t. 16; Red. Lil., t. 292; Reich. Ic. Fl. Germ., t. 334, fig. 761. In some varieties this species is highly ornamental. The rhizome is stout, the leaves ensiform, slightly glaucous, 1 to $1\frac{1}{2}$ ft. long, an inch broad. The stems are as long as the leaves, or rather longer, three or four headed; the spathes are two or three flowered, $1\frac{1}{4}$ to $1\frac{1}{2}$ in. long; valves oblong, very ventricose, green or subscariose at flowering time; pedicels very short. The perianth-tube is yellowish green, cylindrical, $\frac{3}{4}$ to 1 in. long; the limb 2 to $2\frac{3}{4}$ in. long; the falls oblong-cuneate, 1 to $1\frac{1}{4}$ in. broad, claret brown towards the tip, the centre much veined with brown on a yellow ground; beard bright yellow; standards oblong, bright yellow, the claw and region immediately above veined with brown; style arms $1\frac{3}{4}$ in. long including crests, which measure $\frac{1}{2}$ in. on the inside line, and are of bright yellow colour, oblong-deltoid in shape. A yellow variety is figured in *The Garden* of Nov. 6, 1897. The variety *De Bergii* is very richly coloured, and the dimensions given above are ex-

tended to bring it within the description. Is native of Austria, Turkey and South Russia, and flowers in June.

The following is a selection of good garden forms. All have yellow standards with the exception of Alba:—

Alba (Innocenza), standards and falls ivory white.

Aurea, falls rich chrome yellow.

Beaconsfield, falls crimson, edged primrose.

Favourite, falls lilac, margined white.

Gracchus, falls crimson, reticulated white.

Hector, falls velvety crimson-black.

John Fraser, falls purple, shaded yellow and reticulated white.

Maori King, falls rich velvety crimson, margined with gold.

Mrs A. F. Barron, falls rose-violet, margined yellow.

Regina, falls white, conspicuously veined lilac, edged primrose-yellow.

Rigolette, falls bright madder-brown, reticulated white.

Sans Souci, falls yellow, reticulated crimson-brown.

A number of garden forms are described in the *Journal of the Royal Hort. Society*, vol. xxviii. p. 188.

90. *I. aphylla*, Linn.; *I. nudicaulis*, Lam.; *I. hungarica*, Waldst and Kit., *Pl. Rar. Hung.*, t. 226; *I. biflora*, Reich. *lc. Fl. Germ.*, t. 332, fig. 759, non-Linn.; *I. bohémica*, Schmidt; *I. furcata*, M. B. *Fl. Taur.*, iii. 42; *I. furcata*, *Bot. Mag.*, t. 2361, *Bot. Reg.*, t. 801; *I. subbiflora*, Fieber; *I. Fieberi*, Siede. This is an Iris of many names, and the above are a selection of those most likely to be met with. The rhizome is stout and short creeping. The leaves are ensiform, glaucescent, $\frac{1}{2}$ to 1 ft. long at flowering time, under an inch broad. The stems are $\frac{1}{2}$ to 1 ft. long, usually more than one-headed, often forked low down; spathes one to two flowered, $1\frac{1}{2}$ to 2 in. long; valves oblong or oblong-lanceolate, greenish at flowering time; pedicels very short. The perianth-tube is cylindri-

cal, $\frac{3}{4}$ to 1 in. long; limb dark lilac, 2 to $2\frac{1}{2}$ in. long; falls obovate-cuneate, about an inch broad; beard white; standards a little broader than the falls; style branches an inch long; crests deltoid. A native of Eastern Europe from Hungary and Silesia to the Caucasus. A special feature of this plant (Lamarck's *I. nudicaulis*) is that the stem seems to rise naked from the rhizome, not being clothed with bracts. Another feature is that the leaves die off early and entirely.

For the *Aphylla* group of Catalogues, see under *I. plicata*.

91. *I. lurida*, Ait., *Hort. Kew.*, 68; *Bot. Mag.*, t. 986, note 669; *Red. Lil.*, t. 418. The difference between this, *I. squalens* and *I. sambucina*, is not, I think, great. The present plant is understood to have no scent of Elder, while *I. sambucina* is strongly scented and *I. squalens* slightly scented. The stems of *I. lurida* should scarcely overtop the leaves, and while the standards are of purplish-copper colour, or between yellow and purple, the falls are plain, dead purple at the top, the lower half being veined with dull purple on yellowish ground. The rhizome is stout, the leaves ensiform, about a foot long, and slightly glaucous. The stems are three or four headed; the spathes two or three flowered, $1\frac{1}{2}$ to 2 in. long. The limb is 2 to $2\frac{1}{2}$ in. long; the tube an inch long; falls obovate-cuneate, an inch broad, beard bright yellow. The standards are rather broader than the falls; the crests deltoid. Barr's variety, *stenopetala*, has stems which much overtop the leaves, and the tube is $\frac{3}{4}$ in. long. There are garden intermediates between this and *squalens*. The species is native of the South-East of Europe, and like all allies is very easily cultivated.

92. *I. benacensis*, Kerner; Stapf, in *Verh. Zool. Bot. Wein*, 1887, 649. A beautiful plant, earlier this season than any other tall *Pogoniris* of purple colour. The rootstock is stout and short-creeping. The leaves are about a foot long. The stem but little exceeds the

leaves in height; the outer spathe-valves are lanceolate, strongly tinged with purple, scariose at the tip when flowering. The flower is $4\frac{1}{2}$ in. in height from apex of fall to that of standard; the tube is $1\frac{1}{4}$ in. long; limb very blue-purple in colour, the falls obovate, $3\frac{1}{2}$ in. long, $1\frac{3}{8}$ in. broad, white beneath style with purple lines; beard purplish white to half-way down, then yellow; standards oblong, $3\frac{1}{2}$ in. long, $1\frac{1}{2}$ in. broad; anthers rather shorter than filaments, with bluish pollen; style-arms $1\frac{1}{2}$ in. long to stigmas; crests deltoid. A native of South Tyrol on calcareous rocks above Arco. Cultivation is quite easy.

93. *I. Kochii*, Kerner; Stapf in *Verb. Zool. Bot. Wein*, 1887, 649. The leaves are subglaucous. The stems 12 to 15 in. long, three or four headed, about as long as the leaves; the spathe-valves lanceolate, only the outermost herbaceous at flowering time. The perianth-tube is longer than the ovary; limb dark violet; falls with obovate blade, its haft veined with brown; the beard yellow. The standards are obovate, crests obovate-deltoid. The capsule is oblong trigonous. Is native of Istria near Trieste and Rovigno.

IV. Germanicae

Earlier flowering.

- | | |
|---|--------------------------|
| Falls and standards lemon
yellow | 94. <i>I. FLAVESCENS</i> |
| Falls lilac-purple; standards
dull yellow tinged with
purple (fawn coloured,
coppery or bronzy), slightly
elder-scented | 95. <i>I. SQUALENS</i> |
| Falls coloured and veined
claret-purple; standards dull
yellow-tinged lilac, strongly
elder-scented | 96. <i>I. SAMBUCINA</i> |

Falls purple ; standards lilac ;
flowers not usually fragrant 97. *I. GERMANICA*

Falls and standards white ;
beard white, tipped yellow,
sweet-scented . . . 98. *I. KASHMIRIANA*

Later flowering.

Falls violet purple ; standards
pale lilac or lavender to
purple . . . 99. *I. NEGLECTA*

Falls pale lilac towards tip,
veined on haft with drab
yellow on white ground ;
leaves green . . . 100. *I. CORYGEI*

Falls white to violet purple ;
standards white or faintly
tinged with lilac ; style
branches white, or nearly
white ; valves green or
scarious . . . 101. *I. HYBRIDA*

Falls reddish purple with
many dark veins ; standards
bright blue purple ; beard
white . . . 102. *I. BILIOTTI*

Falls and standards bright ;
lilac flowers, fragrant, 6 to
7 in. diam. . . 103. *I. CYPRIANA*

Falls yellowish flaked purple,
margined yellow below ;
standards lighter with
bearded claw ; spathe-valves
green, large and divergent 104. *I. BARTONI*

94. *I. flavescens*, D.C. in *Red. Lil.*, t. 375 ; Sweet,
Brit. Fl. Gard., ser. 2, t. 56 ; *I. imbricata*, Lindl. in *Bot.*
Reg., 1845, t. 56. If we omit *I. sordida*, which has falls
veined with claret-purple, this is the only Iris of the
group *Germanicae* which has clear yellow flowers. The

rhizome is stout, the leaves ensiform, glaucous, 12 to 15 in. long at flowering time, about an inch broad. The stem is three or four headed, 2 to 3 ft. long; the spathes two or three flowered, valves oblong, subscariose, imbricated, not more than 1 to $1\frac{1}{2}$ in. long; the pedicels very short. The perianth-tube is under an inch long; limb bright yellow, $2\frac{1}{2}$ in. long; falls obovate-cuneate above an inch broad, the beard deeper yellow; standards obovate, rather broader than the falls, pale yellow; style-branches above an inch long, crests deltoid. A native of Bosnia, the Caucasus, and Armenia. Flowers in May and June. Is very easily cultivated. In the Kew List of Herbaceous Plants is a variety *leucantha*.

95. *I. squalens*, Linn.; *Bot. Mag.*, t. 787; Reich, *lc. Germ.*, t. 336, fig. 763. Many of the common so-called German Irises belong to this species. It has a stout rhizome. The leaves are ensiform, glaucous, 1 to $1\frac{1}{2}$ ft. long, 1 to $1\frac{1}{2}$ in. broad. The stems are 2 to 3 ft. long, three or four headed; spathes two or three flowered, $1\frac{1}{2}$ to 2 in. long, valves oblong subscariose; pedicels short. The perianth-tube is under an inch long; limb $2\frac{1}{2}$ to 3 in. long; falls obovate-cuneate, the upper part bright lilac-purple, claw veined with lilac-purple on a whitish or yellowish ground; beard bright yellow; standards obovate, as long and as broad as the falls, of plain dull lilac and yellow or brownish and yellow; style branches above an inch long; the crests deltoid. Is native of Central Europe to the Caucasus and North Persia.

I have not the plant in flower and the above details are from Baker's description. Klatt describes the falls as lined with white and yellow to the top, and in the *Botanical Magazine* they have no self-coloured area. The standards in this work are of bluish-yellow colour, but in Redouté they are yellow. The crests are represented as ovate-lanceolate and toothed. *I. squalens* has a slight scent of elder.

96. *I. sambucina*, Linn. *Sp. Plant.* 55; *Bot. Mag.*, t. 187; Reich, *Lc. Fl. Germ.*, t. 335, fig. 762. The strong scent of elder, on account of which the name is given, is characteristic of this plant. Mr Baker regards this as differing from the last by its less robust habit, narrower perianth segments, and falls coloured and veined with claret—not lilac—purple, and in the conspicuously emarginate standards as well as in the more decided elder-like scent. I have the wild plant, and its standards are not, I think, noticeably emarginate. The flower may be described as follows—tube $\frac{3}{4}$ in. long, limb $2\frac{3}{4}$ in. long; falls obovate-cuneate, $1\frac{3}{8}$ in. broad; upper half of blade plum-purple with faint indication of darker lines, below this, lined with purple on whitish ground, the haft veined with brownish-purple on yellowish-white ground; beard yellow, the hairs tipped with dark purple; standards broadly obovate, slightly broader than the falls, of sombre purplish-yellow colour; style arms $1\frac{1}{2}$ in. long, including the crests; crests ovate lanceolate, toothed on outer edge, colour similar to standards. Is native of Central Europe to the Caucasus and Armenia. Is flowering this year (1903) at Cambridge in June, with *squalens* (rather earlier) and *lurida*.

97. *I. germanica*, Linn.; *Bot. Mag.*, t. 670; *Red. Lil.*, t. 309; *Lc. Fl. Germ.*, t. 338, fig. 365. This is the commonest of all Irises and is yet indispensable. It adorns the cottager's garden all over the country. The rhizome is stout, readily spreading. The leaves are glaucous, 1 to $1\frac{1}{2}$ ft. or nearly 2 ft. long, $1\frac{3}{8}$ in. broad; the stem is about 2 ft. long, valves oblong lanceolate, tinged with purple-green in the lower half at flowering time; pedicels short. The perianth-tube is cylindrical, purplish, not quite an inch long, limb $2\frac{1}{2}$ to $3\frac{1}{2}$ in. long; falls broadly obovate-cuneate, dark purple, $3\frac{1}{2}$ in. long, $1\frac{1}{2}$ to $2\frac{1}{4}$ in. broad; beard bright yellow or pale yellow; standards as broad or slightly broader than the falls,

bright lilac, obovate ; style branches $1\frac{1}{2}$ in. long to crest tips ; crests deltoid, toothed. The flowers, I think, have some fragrance but they are described as scentless. Is native of Central and South Europe.

Var. *australis* (Tod.). This Mr Baker places under *I. pallida*, but my plant, the authenticity of which is hardly open to doubt, is certainly a variety of *I. germanica*. It differs from the type only in having claret-purple standards, which are slightly longer, a pale yellow beard, and much less white in front of the style. Its bracts are not so scarious as in *I. pallida*. It is a handsome plant, and I have it also under the name *atroviolacea*.

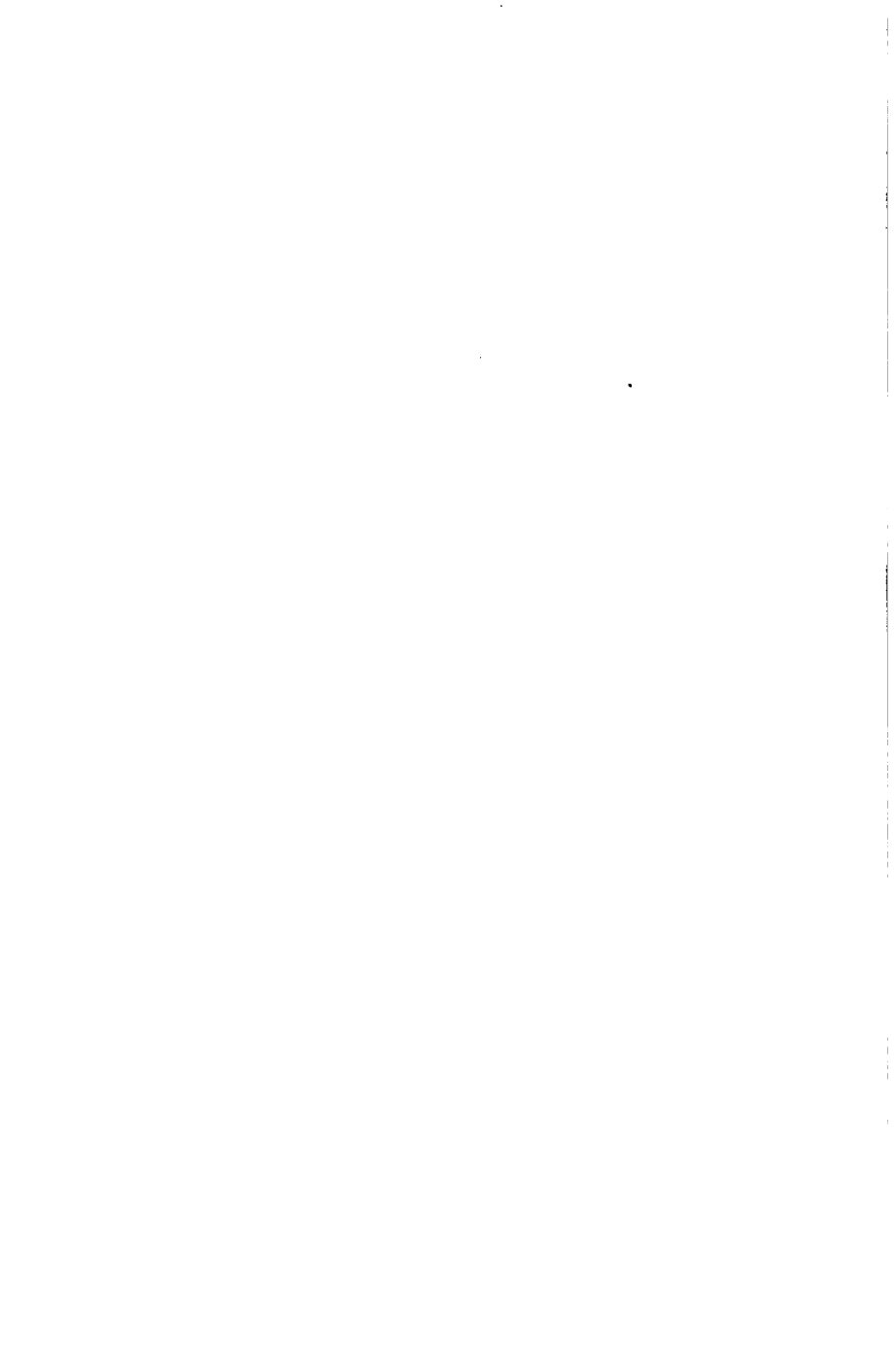
Var. *Siwas*, Fost. *Gard. Chron.*, June 4, 1887, p. 739. Sir Michael Foster considers this worthy of a varietal name because of the colouration, together with the very marked characters of the ripe capsule. It was found south of Trebizond, near Kalahissar, in the province of Siwas, and hence its name. The leaves differ from those of ordinary *germanica* in being narrower, less stout, and of more yellowish green colour. The tube is purple, the falls of indigo-purple, and the standards almost an Oxford blue. The capsule is trigonal with sharp edges, and *very short*, being not much longer than broad. The flowers I find are slightly fragrant, and the claw of standard is distinctly hairy in the channel.

Var. *Amas*, Foster. The flowers of this variety, unlike those of the type, are slightly fragrant. The beard is yellow ; the style-arms, except along the ridge and the crests, are white. There is no V-shaped space between the crests as in the variety *Siwas*. It is sometimes known as *macrantha*.

In Mr Barr's selection there is a variety, *alba* ; Kharput (*asiatica*), with rich blue standards and falls of violet purple, described as twice as large as the type ; and "Purple King," a full purple and very effective. In *The Garden* of June 30, 1900, a form is figured under the



IRIS GERMANICA



name "Black Prince," for which an award of merit was made to Mr Perry by the Royal Horticultural Society.

The form "Gracchus" is described as having six falls and six standards, but monstrosities of this kind can never be recommended.

There is a very handsome and fragrant *I. troyana*, from Western Asia Minor, which is closely allied to *I. germanica*. Messrs Barr & Sons offer a new variety called *magnifica*. *I. trojana* of Kerner belongs to the Apogon section.

98. *I. kashmiriana*, Baker in *Gard. Chron.*, 1877, ii. 744. Rhizome stout; leaves ensiform, slightly glaucous, $1\frac{1}{2}$ ft. long, above an inch broad; stem 3 ft. long, bearing several clusters; spathes two or three flowered, 3 in. long; valves scariose at the tip at flowering time; pedicels short; perianth-tube cylindrical, above an inch long; limb 3 in. long, pure white; standards and falls each $1\frac{1}{4}$ to $1\frac{1}{2}$ in. broad; beard $1\frac{1}{2}$ in. long, white, tipped with yellow; falls obovate-cuneate; style branches $1\frac{1}{2}$ in. long; crests large, ovate. The flowers are sweet-scented, produced late in May. A native of Kashmir.

99. *I. neglecta*, Horn, *Bot. Mag.*, t. 2435. The rhizome is stout; leaves ensiform, slightly glaucous, purple at the base, 12 to 15 in. long, 1 to $1\frac{1}{4}$ in. broad. The stems are $1\frac{1}{2}$ to 2 ft. long, three or four headed; spathes two or three flowered, valves oblong, 1 to $1\frac{1}{2}$ in. long, green on the lower part at the flowering time, much tinged with purple; pedicel very short. The perianth-tube is greenish, under an inch long; limb 2 in. long or more; falls obovate-cuneate, 1 to $1\frac{1}{4}$ in. broad, in the type bright lilac towards the tip; the haft much striped with lilac on a white ground; beard bright yellow; the standards as long and as broad, bright light lilac; style branches an inch long; crests deltoid. Is known only in cultivation, and is apparently a hybrid between *variegata* and *sambucina*. Flowers in June. The

above particulars are those of the type; colour varies in the forms to which names have been given, but the standards are always between lavender and purple. The following is a selection:—

Clarissima, falls reticulated, crimson-purple on a white ground; standards lavender.

Cythere, falls rich blue; standards lavender blue.

Florence Barr, falls and standards bluish, tinted rose-lilac.

Mons de Sible, falls deep crimson-purple; standards lilac.

Virginie, falls bright violet; standards soft blue.

Willie Barr, falls white, freely traced with violet; standards french grey.

100. *I. Corygei*. This plant was received at Kew some years ago from Dr Lange, but I have no further information of its origin. It is remarkable among all its allies on account of its green leaves. They are about 20 in. long and 1½ in. broad, very falcate and so weak that many of a clump bend over. The surface is very uneven on account of prominent ribs. Mr Baker considers it a close ally of *I. neglecta*, and says that it has orbicular spathe-valves an inch long; falls pale lilac towards the tip, veined on the haft with drab yellow on a white ground. As I have no flowers at all this season, it cannot be described as free flowering.

101. *I. hybrida*, Retz; *I. amoena*, D.C. in *Red. Lil.*, t. 336; Sweet, *Brit. Fl. Gard.*, ser. 2, t. 165. Some very charming Irises come under this so-called species, and it may usually be recognised by its white standards in contrast with coloured falls, though these also are sometimes white. It differs from *neglecta* by its rather longer spathe-valves. Flowers in June. The following is a selection of forms—

Alice Barr, falls white, shaded, pale-lavender.

Duc de Nemours, falls purple, edged white.



IRIS ASIATICA

Mrs G. Darwin, falls white, the upper part reticulated gold and violet.

Mrs H. Darwin, falls white, slightly reticulated with violet at the base. Exceedingly attractive.

George Thorbeck, falls rich clear violet-purple, reticulated, white at base. *The Garden*, Nov. 6, 1897, plate 1143.

Victorine, falls violet-blue, mottled white.

102. I. Biliotti, Foster in *Gard. Chron.*, June 4, 1887, p. 738. This handsome and delightfully fragrant Iris was introduced by Sir Michael Foster, who, while recognising its relationship to *I. germanica*, regards it as deserving of specific rank on account of the large and conspicuous, persistent, green and widely divergent spathe-valves, the deeply grooved ellipsoidal ovary, to say nothing of the form and texture of the leaf and colour of the flower. The rhizome is that of *I. germanica*. The leaves are 18 in. to 2 ft. long, $1\frac{1}{2}$ to $1\frac{3}{4}$ in. broad, narrowed somewhat suddenly to a point at the apex, and of darker green than in *I. germanica*. The stem is about $2\frac{1}{2}$ to 3 ft. long, spathe-valves 3 in. long, $\frac{5}{8}$ in. broad, scarious at the very apex only when flower is expanded, so widely divergent as to expose much of the ovary. The falls are spatulate-cuneate, $3\frac{1}{2}$ in. long, $1\frac{1}{2}$ in. broad; blade reddish purple with numerous dark veins; beard white, tipped with yellow; the hairs not numerous but stout and clavate; standards orbicular, $3\frac{1}{2}$ in. long, 2 in. wide, of fine blue-purple colour marked with delicate blue veins; claw creamy white on the upper surface, marked on both sides with brown dots and broken veins; style-arms obovate, $1\frac{1}{2}$ in. by $\frac{5}{8}$ in. without crests, nearly white except for purplish flush on under surface below stigma; crests triangular, $\frac{5}{8}$ in. by $\frac{3}{8}$ in., pointed and reflexed, of reddish purple with blue veins. The tube is $\frac{7}{8}$ in. long, hollow for more than half its length. The ovary is six grooved, three deeper than the

others. Is native of the province of Siwas, south of Trebizond. Flowers in June rather later than *I. germanica*.

103. *I. cypriana*, Foster and Baker in *Gard. Chron.*, 1888, ii. p. 182. The exigencies of classification have brought this plant into this group, but really it is closely allied to *I. pallida*, and might be regarded as a fine variety of that species. The rhizome is similar to that of its allies; the leaves are 2 ft long by not more than $1\frac{1}{4}$ in. broad; the spathe-valves are not entirely scariose at flowering time. The perianth-tube is 1 in. long; the falls are obovate-cuneate, 4 in. long, white with brown lines as far as the beard extends; the blade of a beautiful light lilac; beard yellow; the standards are elliptical, $3\frac{3}{4}$ in. long, of colour similar to that of the falls; the style-branches are 2 in. long, including crests. The flowers are striking in size, beautiful in colour, and fragrant. Is native of Cyprus. It flowers about mid-June and after.

104. *I. Bartoni*, Foster in *Gard. Chron.*, 1883, xix. p. 275; Baker in *Bot. Mag.*, t. 6869. This is a yellow-flowered Iris, well marked by its spathe-valves, which are green after the flowers are faded, and by its habit of having a few hairs on the lower part of standards. The rhizome is stout; leaves ensiform, green and not very glaucous, $1\frac{1}{2}$ ft. long, $1\frac{1}{2}$ to 2 in. broad; the stem is rather longer than the leaves, usually once forked; the spathes are two or three flowered; valves oblong, lanceolate, 4 to $4\frac{1}{2}$ in. long, green at flowering time and after. The flowers are pale yellow and fragrant; the perianth-tube is greenish, an inch long; falls obovate-cuneate, dull yellow, tinged with green, sometimes with purple shading, $3\frac{1}{2}$ to 4 in. long, $1\frac{1}{2}$ in. broad, reflexing from below the middle, veined with purple on the half; beard white, tipped with orange yellow; standards pale yellow, obovate, $1\frac{1}{2}$ in. broad; style branches above an

inch long, crests deltoid. Was introduced from Kandahar by Sir Michael Foster and figured from the Cambridge Botanic Garden.

V. Pallidae.

* Tube an inch long.

Flowers white or nearly so,
produced early in May,
valves subscariose. Not
scented 105. I. FLORENTINA.

Flowers light or dark violet,
produced in June, valves
quite scarious. Usually
scented (see *I. cypriana* in
IV. Germanicae) 106. I. PALLIDA

** Tube $\frac{1}{2}$ in. long.

Stem 2 to 3 feet long, falls
 $1\frac{1}{4}$ in. broad, white veined
with lilac towards margin
and claw, flowering in June 107. I. PLICATA

Stem 1 to $1\frac{1}{2}$ ft. long, falls 1
in. broad, white flushed
with purple towards the
edge, flowering in June . 108. I. SWERTII

*** Tube short, $\frac{1}{4}$ to $\frac{1}{2}$ in. long
—see *I. Cengialti* in III. *Variegatae*.

105. *I. florentina*, Linn.; *Bot. Mag.*, t. 671; *Red. Lil.*, t. 23; Sibth. *Fl. Graeca*, t. 39 (see accompanying plate). The rhizome of this species is stout; it forms the Orris-root proper of druggists, but allies are also used. The leaves are ensiform, glaucous, 1 to $1\frac{1}{2}$ ft. long, 1 to $1\frac{1}{2}$ in. broad. The stems are three to four headed, overtopping the leaves; spathes two to three flowered, $1\frac{1}{2}$ to 2 in. long; valves oblong, subscariose at flowering time; pedicel

short. The perianth-tube is greenish, an inch long; limb 3 to $3\frac{1}{2}$ in. long; falls obovate-cuneate, $1\frac{1}{2}$ in. broad, white slightly tinged with lavender; beard bright yellow; standards as long and as broad as the falls, of purer white; style branches $1\frac{1}{2}$ in. long; crests deltoid, toothed. Native of Central and Southern Europe. Flowers with *I. germanica*.

Var. *albicans* (Lange), *l.c. Plant. Hisp.*, t. 33. Flowers purer white; perianth-tube $\frac{3}{4}$ in. long; limb 3 in. long; beard pale yellow. The spathe-valves are shorter than those of the type, and the inflorescence is more compact. Flowers later than *I. florentina*. There is a garden form named "Princess of Wales." Native from Spain to Cyprus.

106. *I. pallida*, Lam.; *Bot. Mag.*, t. 685; *Garden*, Feb. 14, 1888; *Red. Lil.*, 366; Maund's *Botanic Garden*, iii. 303. Though not so frequently met with as some other species, this certainly should not be omitted from any collection. The flowers are fragrant and usually of lovely blue-lilac colour. The rhizome is stout, the leaves ensiform, very glaucous, 1 to $1\frac{1}{2}$ ft. long, 1 to $1\frac{1}{2}$ in. broad. The stems are several-headed and much overtop the leaves; spathes 2 to 3 in. long; valves oblong, 1 to $1\frac{1}{2}$ in. long, quite scarious at flowering time; pedicel very short. The perianth-tube is cylindrical, an inch long; limb $2\frac{1}{2}$ to $3\frac{1}{2}$ in. long; falls obovate-cuneate, $1\frac{1}{2}$ in. broad; beard bright yellow; standards orbicular, $1\frac{1}{2}$ to 2 in. broad; style branches $1\frac{1}{2}$ in. long; crests deltoid. A native of South Europe and West Asia, ascending to 7000 ft. on the Atlas Mountains. *I. Junonia* is an intermediate between this and *I. germanica*. Good garden forms are the following:—

Albert Victor, falls soft lavender, standards soft blue.

Assaurey, falls crimson, standards rose pink.

Dalmatica Princess Beatrice, flowers very large, falls



IRIS FLORENTINA

clear deep lavender, standards lavender. This is one of best.

Delicata, falls lavender shading to white, standards French grey.

Madame Pacquette, bright rosy lilac.

Queen of May, soft rosy lilac, almost pink.

There is a form with variegated leaves.

107. *I. plicata*, Lam. *Encyc.*, iii. 294. Though allied to *I. pallida* and with the same rhizome, leaves, stem and spathe-valves, it is very distinct in appearance. It is marked by having white falls veined with lilac at the margin, and standards also white flushed with violet at the edge. The stems are 2 to 3 ft. high. The tube is greenish, $\frac{1}{2}$ in. long; limb 2 to $2\frac{1}{2}$ in. long; falls obovate-cuneate, $1\frac{1}{2}$ in. broad; standards as long and as broad, overtopping each other; style arms purplish or lilac. The flowers are fragrant and are produced in June. Is known only in cultivation. Sir Michael Foster considers this a cross between *I. sambucina* and *I. pallida*. There is a beautiful form known as "Madame Chereau" which belongs here, as do others of the so-called "aphylla" section in *Barr's Catalogue* and in *Journ. Royal Hort. Soc.*, xxviii. p. 184. The properly complete name, which explains the origin of this wrong designation, is *I. aphylla* var. *plicata* (*Bot. Mag.*, t. 870), *I. plicata* being here referred, in error apparently, to a species it does not in the least resemble.

108. *I. Swerti*, Lam. *Encyc.*, iii. 294; *Red. Lil.*, t. 306; Reich. *Lc. Crit.*, fig. 1239. There is, I think, nothing to distinguish this from *I. plicata*, save colour and height, and both apparently might have come from the same cross. The stems are 1 to $1\frac{1}{2}$ ft. high, three to four headed; spathe-valves oblong, scariose, an inch long, slightly tinged with violet. While the coloration of *I. plicata* is violet, it is here of pale pinkish purple, the form of the venation and flushing of colour being very much

the same. The flowers are fragrant and are produced in June as in the case of *I. plicata*.

VI. Chrysantha.

109. *I. chrysantha*, Baker in *Bot. Mag.*, 1901, t. 7784. This very fine Iris, while distinctly belonging to the Pogoniris section, is unlike all its associates in having long, narrow leaves and a long stem, with a single cluster of flowers. It is so distinct that I have no hesitation in establishing a sub-section for its reception. The rhizome is quite shortly creeping and small. The leaves are linear, a foot long, firm in texture and glaucescent, with pale margin. The stem is slender and about as long as the leaves; spathe-valves lanceolate-acuminate, 4 inches long, pale green, papery. The perianth-tube is cylindrical, nearly an inch long; the falls oblong, emarginate, 3 in. long, reflexing from near the base and provided in the lower half with a bright yellow beard; standards erect, obovate-cuneate, as long as the falls and rather broader, very shortly if at all unguiculate; ovary distinctly stipitate, clavate, narrowed gradually to both ends, not distinctly ribbed; style arms convex, an inch broad; crests large, quadrate, entire. Is probably a native of Persia. Cultivation, so far as known, may be that of the section *Oncocyclus*.

The only plant known in cultivation was accidentally introduced to the Cambridge Botanic Garden with species of *Oncocyclus*, contributed by Mr C. G. Van Tubergen, Junr., and from it the figure in the *Botanical Magazine* was prepared. So much of the plant was sent for this purpose that the portion left behind died, and the plant is not now in cultivation, but it is hoped that it may be received again. It was planted with the *Oncocycli* and grew well under treatment with them.

CHAPTER XIV

Xiphion.

(Bulbous Irises with large, erect standards.)

- I. Flowers on fully evident stems **TALL XIPHIONS**, see below.
- II. Flowers apparently stemless, the perianth-tube rising direct from the ground . . . **STEMLESS XIPHIONS**, p. 161.

I. Tall Xiphions.

Perianth-tube obsolete.

Segments stiff and narrow.

Leaves subterete; falls with an orbicular blade 1 in. broad, much shorter than the panduriform haft.

Flowers borne above spathe-valves by long pedicel . . . **110. I. XIPHIMUM**

Segments lax and broad.

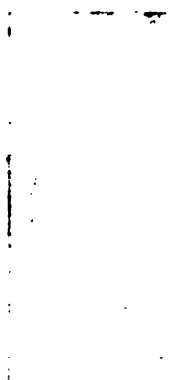
Leaves complicate; falls with an orbicular blade, $1\frac{1}{2}$ in. broad, narrowed to and shorter than the wedge-shaped haft. Pedicel short, ovary not exserted . . . **111. I. XIPHIODES**

Perianth-tube variable, but not exceeding an inch. Fall fiddle-shaped, flowers red purple,

- broad golden patch on blade
of fall, standards notched at
apex 112. *I. FILIFOLIA*
- Perianth-tube 1-2 in. long.
Limb lilac, 3 in. long; stand-
ards pointed, not notched
at apex 113. *I. TINGITANA*
- Limb always yellow, 1½ to
2 in. long 114. *I. JUNCEA*
- Limb purple, with a slight
beard on fall 115. *I. BOISSIERI*
110. *I. Xiphium*, Linn.; *Bot. Mag.*, t. 656; *Red. Lil.*, t. 337; Foster in *Bulbous Irises*, p. 64; *Xiphium vulgare*, Mill; *I. hispanica*, Hort. (see accompanying plate), "Spanish Iris." The bulb is ovoid, $\frac{3}{4}$ to 1 in. diam., with smooth, membranous brown coats. Leaves several superposed, subterete and glaucous, the lower a foot long, sometimes appearing late in autumn. The stem is one-headed, bearing two flowers, 1 to 2 ft. long, partly covered by clasping leaves. The spathe-valves are narrow, 2 to 4 in. long, not inflated, the outer green and lanceolate; pedicel long and raising the flower above the spathe-valves. The perianth-tube is obsolete; limb 4 in. across, violet-purple in the typical form; falls fiddle-shaped, with an orbicular blade which is separated from the long claw by a marked constriction; standards as long, oblong, erect, $\frac{1}{2}$ to $\frac{3}{4}$ in. broad; style branches above an inch long; crests large, quadrate; capsule long, narrow; seeds numerous, small, cubical or angular. The month of flowering is June. Native of the south of France, Spain, Portugal, North Africa and Sardinia.
- Var. *lusitanica*, Ker in *Bot. Mag.*, t. 679. The flowers of this variety are pure yellow with an orange "signal" on the fall. The ovary is less exserted than in the type, and the spathe-valves have some tendency to be inflated. The perianth is more or less distinctly



IRIS XIPHIOIDES



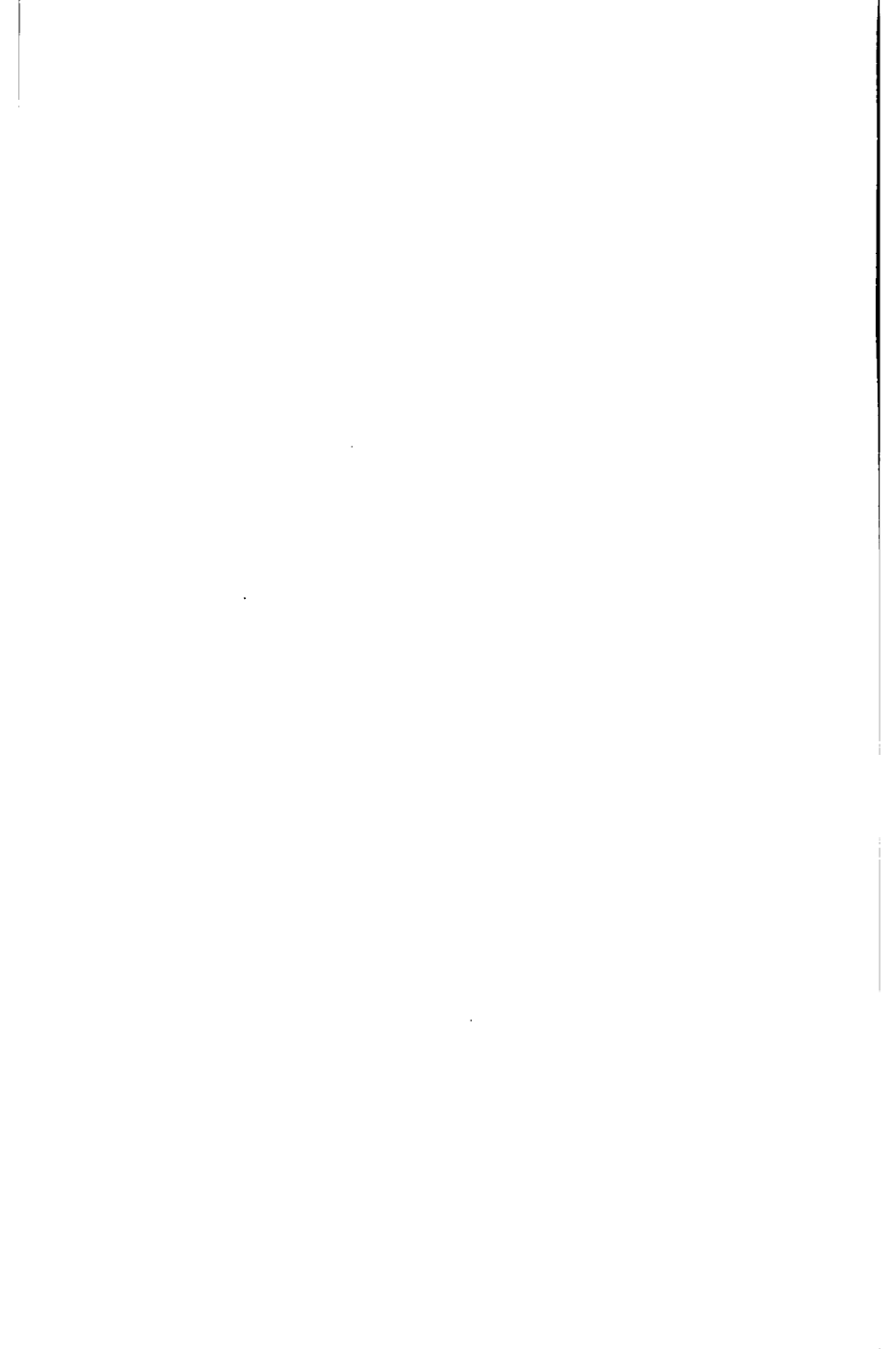
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IRIS XIPHIMUM



funnel-shaped; the claw of the fall is broad, overlapping the style at the sides, and covering in the base of the standard.

The "**Thunderbolt Iris**" is a form of this variety, and it is a very fine plant growing 2 ft. or more in height and producing a flower which requires a circle 5 in. in diameter to enclose it. The flowers are of a peculiar bronzy colour, as if due to a contest between yellow, purple and brown, and the "signal" patch of yellow on the fall is remarkable for its breadth. The pedicel is $2\frac{1}{2}$ in. and the ovary 2 in. long. An illustration will be found in Sir Michael Foster's *Bulbous Irises*, p. 22. It does not of itself bear seed, and is perhaps a cross between *I. lusitanica* and *I. filifolia*.

Var. **Battandieri**, Foster in *Bulbous Irises*, p. 65, with parts of the flower illustrated on p. 66. The flowers are of pure dead white with the exception of a bright orange ridge on the fall. The bulb, foliage and general habit are as in the type, except that the leaves are very glaucous. The claw of fall is not separated from the blade by a marked constriction; the latter is emarginate, and the whole together very nearly obovate-cuneate in outline, yet with a slight bending in of the marginal line near the middle. The edges are very revolute. The standards are tall and much twisted. A native of Algiers in the Marais de la Rassanta.

The following is a good selection of garden forms:—

Avalanche, falls snowy white with large golden blotch, standards china white, crimped.

Blue Beauty, falls azure blue with yellow blotch, standards violet.

*Blanche superba, one of best whites.

Cantab, falls Cambridge blue with orange blotch, standards dark azure.

Golden King, falls glowing deep orange, standards deep golden yellow.

*Golden Cup, one of best yellows, popular.

La Nestale, one of best whites.

Louisa, falls white with golden blotch, standards French grey.

Princess Ida, falls of delicate primrose with orange blotch, standards white.

Queen Victoria, pure white.

Sunset, falls yellow with orange blotch, standards pale lavender.

The Moor, falls rich golden yellow and orange, standards rich chestnut-purple.

These flower in June, about a fortnight earlier than the "English Irises." Those marked by a star, with "Ovidius" and "La Reconnaissance," are considered the best by plebiscite of Dutch Bulb Society.

Culture.—The Spanish and English Irises are similar in their requirements, except that the latter must have a good supply of moisture in summer. In a dry garden the Spanish Iris may do well while the English Iris fails altogether. They are not difficult to grow and are quite among the most beautiful flowers of the garden. In a bed of the Cambridge Botanic Garden, a seedling of the "English Iris" came by chance and increased itself, by-and-by entirely occupying the bed and making a fine display. Planting should be done in autumn as soon as the bulbs can be obtained, and a site open to full sun should be selected. Any good garden soil appears to answer well, but it must be well drained. If the ground is at all poor, surface dressings are valuable; and if stiff, gritty sand may be added with advantage, some of it being used immediately about the bulbs, which should be at a depth of from $3\frac{1}{2}$ to 5 in., according to size. These Irises may be planted among roses where there is plenty of room, but rather than suffer the usual crowding of the mixed herbaceous border they should have beds to themselves, and indeed

they are well worth special treatment. Late planting for late flowers has been tried, but as the bulbs insist upon growing, success by this means cannot be obtained. The "Spanish Iris," it may be noted, grows late in autumn, so that the foliage has attained some height before winter sets in. The "English Iris" does not produce leaves until spring. The "Spanish Iris" has been very successfully grown at Kew in pots. Seedlings are easily raised, and it is interesting in this way to produce new forms. If seed is plentiful, it may be sown in the open; but if not, it is better to sow in a frame, or where the protection of a light can be given. If the quantity is quite small it should be sown in a pan.

III. *I. xiphioides*, *Ehrh. Beitr.*, vii. 140; *Bot. Mag.*, t. 687; *Red. Lil.*, t. 212. *Xiphion latifolium*, Miller, "English Iris." The bulb is ovoid, with brown coats, which when old split into fibres at the top. The leaves are glaucous, linear, complicate, the lower a foot long, appearing in spring; the stem is stout, one-headed, bearing two, sometimes three flowers, $1\frac{1}{2}$ to 2 ft. long; the spathe-valves are green, lanceolate, ventricose, 3 to 4 in. long; the pedicels are much shorter than the spathe. The perianth-tube is obsolete, limb 2 to 3 in. long, dark violet purple in the typical form, according to Mr Baker; wild plants, Sir Michael Foster says, being usually of rich deep blue, with a conspicuous golden "signal" on the fall; the falls have an orbicular blade $1\frac{1}{2}$ in. broad, narrowed to and shorter than the cuneate haft; standards shorter than the falls, oblong or obovate, $\frac{1}{2}$ to 1 in. broad; style branches above an inch long; crests large, subquadrate. The capsule is large, of long pointed oval shape, with three flattened sides; the seeds are rounded or pyriform, with wrinkled coats. Flowers after the Spanish Iris in July. Is native of the French and Spanish Pyrenees, in the west of Spain reaching to

Burbia. For culture see *I. Xiphium*. The following garden varieties are among the best :—

Blanche Fleur, falls white ; standards white, with rosy tinge.

Clara Butt, falls china white, faintly spotted azure ; standards china white, faintly flaked azure.

Emma, falls French grey, shaded white, faintly spotted blue ; standards French grey, faintly flaked blue.

Emperor, falls brilliant blue, sometimes marbled dark velvet blue ; standards violet, flaked dark purple.

Grand Céleste, falls bright blue ; standards light blue.

Lilacina, falls pale lavender, slightly spotted blue ; standards deep lavender, splashed violet.

Lord Palmerston, falls rich crimson purple ; standards purple-claret, flaked black.

Mont Blanc, falls and standards pure white.

Prince Mauritz, falls ruby-purple, with conspicuous white and yellow blotch ; standards ruby, flaked black.

Rosa Bonheur, falls white ; standards white, flaked crimson-violet.

Triumph, falls pale azure blue, netted white, with conspicuous white blotch and yellow eye ; standards pale rosy purple.

Vainqueur, falls delicate lavender ; standards deep lavender, feathered violet.

112. *I. filifolia*, Boiss. *Bot. Mag.*, t. 5928 and t. 5981 (under the name *tingitana*) ; *Xiphium filifolium*, Klatt. The bulb is like that of *I. Xiphium*, except that the coats are more slender and veined rather than ribbed ; stem 1 to 2 ft. high ; leaves quite filiform in the type, but varying much in breadth. The flowers are like those of a top-shaped *I. Xiphium*, but have a perianth-tube of nearly an inch in length ; they are either of dark



IRIS XIPHIODES

violet or rich red purple, with large "signal" patch of orange ending broadly and abruptly, having a slightly raised ridge in the median line. The falls have an orbicular blade an inch broad shorter than the haft; the standards are shorter than the falls, oblanceolate, half an inch broad, with notch at the apex; the style branches are above an inch long; crests large subquadrate. A native of Spain, Sierras de Mijas and Bermeja, Gibraltar, Morocco, and Algiers.

Cultivation as for *I. juncea*.

113. *I. tingitana*, Boiss. ; Baker in *Bot. Mag.*, t. 6775 ; *Xiphion tingitanum*, Baker. This is not worth general cultivation, but is interesting to many, especially to those who like to persevere with plants that are shy of flowering. The bulb is ovoid, $1\frac{1}{2}$ in. diam., the outer coats thin, reddish brown, with conspicuous veins; leaves linear-complicate, the lower 1 to $1\frac{1}{2}$ ft. long, broad as in *I. xiphioides*, but glaucous and striated on the outside; stem 2 ft. high, completely hidden by the deeply channelled leaves, bearing one or two flowers, 5 to 6 in. across; the spathes 4 to 6 in. long; valves green and lanceolate. The perianth-tube is cylindrical, 1 to $1\frac{1}{2}$ in. long; falls with long claw spreading nearly horizontally, the blade 1 to $1\frac{1}{2}$ in. long, obovate and reflexing, with wavy edge, and notched at the apex; standards erect, rather shorter, oblanceolate, with wavy edge; style-branches cuneate, above an inch long, with large rhomboidal plaited and veined crests. The colour of the fall is light or deep blue, or bluish purple with deeper veins, the claw with low median yellow ridge, which spreads out into a broad yellow signal. The standards and styles are usually deeper in colour, sometimes markedly so. Is native of Tangiers, and flowers in March or April.

Requires a very hot sunny position and thorough resting in summer. With Mr Ewbank it grew fifteen

years without flowering, till at last the hot summer of 1900 apparently caused it to flower. With Sir Michael Foster it has flowered in pots kept in a frame. I believe the true plant has flowered in Cambridge close to a south wall. It usually grows quite freely.

114. *I. juncea*, Desf. *Bat. Mag.*, t. 5890, *Garden*, 1898, Dec. 10, plate 1200. *Xiphion junceum*, Klatt. I consider this a lovely Iris and it is very distinct, being the only tall *Xiphion* with yellow flowers and a long perianth-tube. Its flowers are fragrant. The bulb is globose, with thick rigid reddish-brown outer coats, splitting into long stiff fibres at the top. The leaves are very slender and rush-like, appearing late in autumn, they are superposed and sub-terete, the lower a foot long. The stem is slender and flexuose, one-headed, 1 to 1½ ft. high, bearing two flowers if in good condition; spathe 2½ to 3 in. long; valves greenish lanceolate; pedicels short. The perianth-tube is 1 to 2 in. long, very slender; limb 1½ to 2 in. long, rich yellow in the type; falls with an orbicular blade an inch broad, much exceeding the haft in width, which curves in where it reaches the blade; standards oblanceolate, ½ in. broad, shorter than the falls; style-arms narrowly cuneate, an inch long; crests larger quadrate or, as in a specimen before me, equally curved from base to apex and forming together a nearly exact oval. Flowers in June or July. Native of Algiers, Tunis, Morocco, Sicily and Italy.

Its culture needs a hot dry spot and it must be kept dry for some time after flowering. Sir Michael Foster recommends lifting and replanting somewhat late. He finds it more vigorous in a moderately stiff loam than in sandy soil.

Var. *numidica*, figured in *Garden* with type, as above quoted, is African and has lemon yellow flowers. Messrs Krelage of Haarlem distribute a sulphur-coloured

form under the name **Mermieri** which may be the same. Messrs Barr & Sons offer a variety **pallida**, the flowers of which are said to be large and of lovely soft canary yellow shade.

115. **I. Boissieri**, **Henr.**, Baker in *Bot. Mag.*, t. 7097; Foster in *Bulbous Irises*, figs. 16, 17, 48. Though perhaps a difficult Iris to grow, this is both ornamental and interesting. It is interesting on account of its having a rudimentary beard, and because it is known only on a single mountain in Portugal, the Serra de Gerez, where it grows at an elevation of 2 to 3000 ft. It was discovered by Mr A. W. Tait, who sent bulbs to Sir Michael Foster. The flowers are of rich red-purple. The bulb is under an inch in diameter with coats splitting into fibres at the top. The leaves are slender, sub-terete, a foot long; stem a foot high, one headed, almost entirely hidden by the dilated leaf-bases; spathe $2\frac{1}{2}$ in. long, outer valves lanceolate green; pedicels short. The perianth-tube is nearly 2 in. long, almost hidden within the spathe-valves; limb $1\frac{1}{2}$ in. long; falls with an oblong blade, $\frac{1}{2}$ in. broad, as long as the haft, which has a distinct beard reaching nearly to the front of the "signal" patch of bright orange; standards as long as the falls, obovate, $\frac{1}{2}$ in. broad; style-arms an inch long, crests sometimes deltoid, otherwise large and quadrate. Flowers in June. Native of North Portugal.

With regard to culture, Sir Michael Foster, writing some years ago, believes that, like the "English Iris," it requires more moisture in spring than is afforded by his garden.

II. Stemless Xiphions.

Leaves, eight-ribbed, cylindrical 116. **I. BAKERIANA**

— linear with thickened edge

forming a channel . 117. **I. KOLPAKOWSKIANA**

Leaves four-angled.

Claw of fall much narrower
than blade, flowering in
autumn 118. *I. VARTANI*

Claw of fall nearly as
broad as blade, flower-
ing in spring . . . 119. *I. RETICULATA*

VARIETIES OF *I. RETICULATA*.

Leaves long when flowers ex-
pand.

Flowers deep violet-purple . . . the type
— blue spotted on white 119a. var. *HISTRIO*
— red purple with con-
spicuous veins on claw . 119b. var. *KRELAGEI*
— dwarf, red purple . 119c. var. *HUMILIS*
— — bright blue . 119d. var. *CYANEA*

Leaves very short when flowers
expand.

Segments long and narrow 119e. var. *SOPHENENSIS*
— broad, colour bluish,
often spotted . . . 119f. var. *HISTRIOIDES*
— broad, colour red
purple 119g. var. *PURPUREA*

This definition and arrangement of the varieties of
I. reticulata is from Sir Michael Foster.

116. *I. Bakeriana*, Foster in *Bot. Mag.*, 1889, t.
7084; *Garden*, 1897, plate; Foster in *Bulbous Irises*,
figs. 9, 10, 38. This is one of the most charming of
Irises and of great value in the garden, producing its
sweetly scented flowers very early in spring. The bulb
is ovoid and has netted coats consisting of strong parallel
fibres connected by oblique strands. The leaves are

nearly a foot long at flowering time; they are furnished with a horny point, and are cylindrical, with eight ribs. The peduncle is very short and bears one flower; spathe 3 in. long; valves green, very unequal. The perianth-tube is 3 in. long, slightly exserted above the spathe; perianth 2 to 3 in. across; falls with a long claw and short, ovate, reflexing blade, the marginal regions of latter deep violet, the central portions creamy white or yellowish, with numerous deep violet spots or blotches. The claw has violet veins on the sides, but is more or less yellow along the centre, with violet spots. The standards are rather shorter than the falls, erect, oblanceolate, bluish lilac in colour. The style branches are an inch long, the crests large, subquadrate, lilac. The ripe capsule is pointed, thrown above the ground by its stem. Is native of Armenia, near Mardin.

Cultivation is easy; the rockery, or border, prepared for bulbous Irises, suits it well. It may be grown in pots, and in a cold frame will flower in January. A form called "Norma" has been distributed by Herr Max Leichtlin. It is described as larger, deeper, and brighter in colour than the type.

117. *I. Kolpakowskiana*, Regel, *Descr.* v. 47; *Gartenflora*, t. 939; *Garden*, 1888, t. 658, fig. 4; *Xiphion Kolpakowskianum*, Baker in *Bot. Mag.*, t. 6489. The bulb is ovoid or globose, $\frac{1}{2}$ in. diam., with netted coats. The leaves are linear, with each edge thickened into a ridge, thus forming a channel. They are 2 to 3 in. long when the flowers appear. The stems are one-headed, not produced; spathes, one-flowered, 2 in. long; valves green, lanceolate. The perianth-tube is 2 in. long; falls with an ovate or oblong blade $\frac{1}{2}$ in. broad, bearing a low orange median ridge continuing as a mere streak down the claw, which is separated from the shorter blade by a slight construction; standards as long as the falls, oblanceolate, with a short claw; style-branches an inch

long, united below into a column reaching above the tube; crests large, lanceolate, deltoid. The blade of fall is rich red purple, with deeper veins, the area around the ridge being creamy white, with broken veins; its claw yellowish, tending to green, with broken purple veins. The standards and styles are light purple or lilac. The stigma is simple, not distinctly bifid, as in all the *reticulata* group. The flowers have a violet-like fragrance. It flowers with *reticulata* in March; is native in the mountains of Turkestan; is difficult of cultivation.

118. I. **Vartani**, Foster in *Gard. Chron.*, 1885, i. 438; *Bulbous Irises*, figs. 8 and 39; *Bot. Mag.*, t. 6942. Flowering from October to December, this pretty Iris is possessed of a certain merit, though for the reason of winter growth it is difficult to cultivate. It has been described as a lovely Iris on account of its pale blue colour, but also by good authority as one that is only of botanical interest. The bulbs are narrowly ovoid, tufted, $\frac{1}{2}$ in. diameter, the outer coats netted; leaves four-sided, with acute angles, and armed with a horny point; they are four inches or more long at flowering time, finally a foot long. The spathes are one-flowered, $1\frac{1}{2}$ to 2 in. long; valves lanceolate, greenish. The perianth-tube is $2\frac{1}{2}$ in. long, the limb 3 to 4 in. across, but sometimes less; falls with a very narrow claw, suddenly expanding into an ovate-lanceolate blade, $\frac{1}{2}$ in. wide; the median ridge conspicuous, smooth, and yellow or white on the blade, tuberculate and yellow, with black dots on the claw; standards nearly as long as the falls, oblanceolate, $\frac{1}{2}$ in. broad; style-arms $\frac{3}{4}$ in. long; the crests very long, lanceolate. The flowers are dull lavender or pale slaty blue, not fragrant; native of Palestine, near Nazareth. Cultivation should be tried under glass, removing the bulbs from the soil on going to rest. Mr Ewbank appears to have planted about mid-September, obtaining flowers at Christmas.



IRIS RETICULATA

119. *I. reticulata*, M.B., *Fl. Taur. Cauc.* 34, t. 1; *Bot. Mag.*, t. 5577 (not quite typical); *Gard. Chron.*, April 19, 1879, p. 501, fig. 69. This is deservedly one of the most popular of bulbous Irises, and indeed none surpass it in the richness of its purple and gold. It has the delightful fragrance of violets. The bulb is ovoid with netted coats—hence the name. The leaves are acutely four-angled with horny point, short at flowering time, finally a foot or more long; spathes one-flowered, about 3 in. long; green, tightly wrapped around the slender tube, which is 2 to 3 in. long. The limb is of deep rich violet, $1\frac{1}{2}$ to 2 in. long; falls narrow with but slight distinction between claw and blade, the latter $\frac{1}{2}$ in. broad with splendid golden “signal” in front of the stigmas, and low bright orange ridge, which is continued down the claw by a yellow streak marked with dots; standards nearly as long, oblanceolate; style branches an inch long; crests quadrate. It usually flowers in March. Is sparsely native of the Caucasus and surrounding regions.

Cultivation is quite easy, and any good border suits it well. Is valuable for cutting. May be flowered in pots, and if potted about the end of August and plunged in ashes, can be removed later to greenhouse for flowering, it is said, at Christmas. A form, said to be twice the size of type, was distributed by Herr Max Leichtlin some years ago, under the name *major*. Mr T. Smith of Newry has a variety which is pure white, except for the golden “signal.” The late Mr Nelson raised a light blue variety which he called *caerulea*.

119A. *I. reticulata*, var. *Histrio*, Foster in *Bulbous Irises*, p. 57; *I. Histrio*, Reich. fil. in *Bot. Zeit.*, 1871, 488; *Garden*, 1888, June 16, t. 653, fig. 1; *Xiphion Histrio*, Hook. fil. in *Bot. Mag.*, t. 6033. I follow Sir Michael Foster in placing this valuable plant under *I. reticulata*, but from a garden point of view it is very

distinct. In the Cambridge Botanic Garden it rarely fails of opening on the 1st or 2nd of January, and it is perhaps the only one among all its relations that has never died out. The bulb is smaller than that of the type. The spathe-valves are narrow, pointed, nearly colourless and transparent, not green as in *I. reticulata*. The margin of the blade of the fall is of bright blue-lilac, within it is white, but spotted, blotched, and veined with the same colour, in a manner which suggests the use of a brush. In the median line is a low narrow yellow ridge which is continued along the claw as a yellow streak, dotted with black tubercles. The standards and styles are of lighter blue, the crests being marked with deeper veins. These are lanceolate-deltoid, not quadrate as in the type. The flowering season is from January to March, according to situation and season. Is not fragrant. Native of Palestine.

I have found this a very easily grown plant, on narrow border, at foot of south wall.

119B. *I. reticulata* var. *Krelagei*, Regel, *Gartenfl.*, 1873, p. 354; Sweet, *Brit. Fl. Gard.*, ser. ii. t. 189; Lodd. *Bot. Cab.*, t. 189. This variety should be regarded as really the type, though names cannot now be altered. Sir Michael Foster points out that in the native country of the two—the south-eastern regions of the Caucasus—it is much the commoner and the more variable, while seedlings raised from *I. reticulata* have all the characters of the variety *Krelagei*. It is of red-purple colour, varying from dingy plum to deep, almost black, purple, not nearly so ornamental as the type, and rarely fragrant. It is shorter and broader in all its parts; the blade of fall is marked off from claw by a slight constriction. The veins on the claw of fall are very distinct, and separate up to the margin. Different plants vary in size, the length of tube, relative breadth and exact shape of the blade of fall, and in the shape of

crests, which vary also in the margin, whether serrated or not. Flowers in February or March, and usually before the type. Is common in the Caucasus, spreading into Persia and Asia Minor.

119c. *I. reticulata* var. *humilis*, Foster in *Bulbous Irises*, p. 59. This has red-purple flowers, and is one of two dwarf varieties, the other being the variety *cyanea*. The flowers appear while the leaves are a few inches in height. The tube is rarely longer than the green spathe-valves; the flower attains a height of about 2 inches, and is more compact than in other forms. The fall has a narrow claw, from which the much broader ovate-lanceolate blade is marked off by a slight constriction. The blade has a bright orange ridge continuing along the claw as an orange or yellow streak, and about this orange is a zone of opaque creamy white, broken up by dots and broken veins of dark purple. The rest of the blade is of full rich red-purple colour, on which the veins are hardly visible, contrasting strongly with the creamy white zone. At the margin of the claw the veins fuse into a similar red-purple ground colour. Flowers in March between the var. *sophenensis* and the var. *Krelagei*. A native of Asia Minor, near Van.

119d. *I. reticulata* var. *cyanea*, Regel, *Gartenfl.*, t. 797. Mr Baker describes the blade of the falls as slaty-blue and much variegated. Sir Michael Foster, referring, I believe, to the same plant in his *Bulbous Irises*, says, "A few years ago there was introduced, under the name of *reticulata cyanea*, a small dwarf variety, which differs from both the type and *Krelagei*, not only in being of a very striking blue—the blue known as cyanic, verging towards indigo—but also in form, size, stature, and in some other minor features." Again, under the variety *humilis*, he remarks that it agrees with this plant, save that the colour is a rich cyanic blue, and the dots give place to veins.

119E. *I. reticulata* var. *sophenensis*, Foster, *Gard. Chron.*, 1885, i. 470; and in *Bulbous Irises*, p. 58, fig. 35. This variety was introduced by Sir Michael Foster some years ago through the kindness of Mrs Barnum of Kharput. It is characterised, he says, by the narrowness of the segments and the metallic sheen of the coloration, as well as by the fact that the flowers expand as soon as, or even before, the leaves pierce the soil. It occurs in several shades of colour, from red-purple to a lightish blue. The tube is variable in length, but always longer than the spathe-valves; the narrow claw of the fall expands into a blade, which is only half as long as itself, but nearly as broad again. The orange ridge of the blade is continued as a yellow, uneven ridge along the whole length of claw. The whole flower is more spreading and less funnel-shaped than in the type; it is marked with veins only on the claw, and sometimes on the blade of fall. Flowers in February after *Histrio* and before *Krelagei*. It is fairly abundant in Central Asia Minor.

119F. *I. reticulata* var. *histrioides*, Foster in *Bulbous Irises*, p. 9, fig. 7; pp. 59, 60, fig. 37; *Garden*, vol. xlii. (1892), p. 42 (drawing by Miss Agnes Barr). This is intermediate between the type and the var. *Histrio*, which it resembles in coloration, being marked in the same way with bright blue spots and blotches, and therefore called *histrioides*. It differs in the exact tint of colour and in form, especially also in the fact that it expands while the leaves are hardly above ground. The flowers are very beautiful, often larger than those of any other variety of this species, and measure four or even five inches across; the tube is variable in length, but always longer than the spathe-valves, which are short, broad, colourless, or nearly so, and marked by few green veins. The claw of fall gradually widens to the roundish blade, at the commencement of which,

however, there is a slight constriction. The falls spread horizontally, so that the flower is less funnel-shaped than in the type. The style arms are triangular and short, with large, rather quadrangular crests. The prevailing colour is bright blue, sometimes assuming a light violet hue. In some specimens the whole blade and claw outside the ridge is of uniform blue, broken only by veins of deeper colour; in others the margin only of the fall is so coloured, and the region between the margin and the median ridge is, as in *Histrio*, of creamy white, broken by irregular dots and blotches of blue and by imperfect veins. Intermediate forms occur. The flowers are fragrant in a warm atmosphere. Flowers in March, but is variable in relation to other varieties. In the Cambridge Botanic Garden flowers have expanded immediately after a temperature nearly down to zero, and there can therefore be no doubt of hardiness. Is native of Armenia, in the district of Amasia.

119G. *I. reticulata* var. *purpurea*, Max Leichtlin; Foster in *Bulbous Irises*, p. 60. This is intermediate between *Krelagei* and *sophenensis*, flowering at about the same time as the former. The leaves are 2 to 3 in. high, or less, at flowering time. The tube is short, hardly longer than the spathe-valves. The median ridge of fall, unlike the case of var. *Krelagei*, is continued all along the claw. The colour is a fine deep red-purple, darker on the blade of fall, the claw of which is not broken up into veins at the sides as in var. *Krelagei*. Is not distinctly fragrant. A native of Asia Minor in the neighbourhood of Egin.

CHAPTER XV

Juno.

(Bulbous Irises with small spreading standards.)

- I. Stem 1 to 2 ft. high, with developed leaves at flowering time TALL JUNOS, see below
- II. Stem short, but evident; leaves 3 to 6 inches long at flowering time, their margins horny DWARF JUNOS, p. 176
- III. Stem very short; leaves absent, or very short at flowering time in spring, or 6 to 9 in. long in the case of two winter-flowering species STEMLESS JUNOS, p. 179

I. Tall Junos.

For I. Aitchisoni, see p. 195.

- *Stem with one flower, rarely two.

Falls pale yellow; standards purple, without lateral wings

120. I. FOSTERIANA

- **Flowers several or many.

†Claw widening gradually into a spreading or deflexed blade.

Flowers rich yellow, or
yellow and blue, with
grey marks on falls;
stalked; leaves without
horny margin . . .

121. *I. ORCHIOIDES*

††Claws expanding suddenly
into a deflexed blade,
not broadly auricled.

Falls with oval-orbicular
blade of deep violet
colour, with zone of gold
behind; standards vio-
let; margin of leaf horny

122. *I. WARLEYENSIS*

Falls with obovate blade of
golden colour with pur-
ple lines proceeding from
crest; standards pure
white; margin of leaf
horny . . .

123. *I. BUCCHARICA*

†††Claw broadly auricled
below the deflexed blade;
flowers centrally blue,
paler towards the peri-
phery; margin of leaf
not horny . . .

124. *I. SINDJARENSIS*

120. *I. Fosteriana*, Aitch. and Baker, *Trans. Linn. Soc.*, 2nd ser., *Bot.* iii. 114; *Bot. Mag.*, 1892, t. 7215; Foster, *Bulbous Irises*, pp. 44-82, figs. 26 and 56. An interesting plant peculiar in having purple standards, with otherwise yellow flowers, exceptional also in having one, or at most two flowered stems. The bulbs are oblong, 1 in. in diam., with olive green coats; the roots fleshy, thin, and inconspicuous. The leaves are not unlike those of *I. Xiphium*, but very striated on the outside; they number four or six to a

stem about a foot high, are lanceolate-acuminate falcate, 4 to 6 in. long at flowering time, firm in texture with a distinct white margin. The spathes are $1\frac{1}{2}$ to 2 in. long, valves pale green, lanceolate. The flowers are about 2 in. across; perianth-tube hardly exerted above the spathe; falls pale yellow, $1\frac{1}{2}$ to 2 in. long, with an orbicular blade $\frac{1}{2}$ in. broad, a third as long as the notauricled haft, and bearing a median plate; standards bright red-purple, an inch long with an obovate blade, sometimes $\frac{1}{2}$ in. broad; style branches an inch long, crests large, subquadrate. Flowers in March. A native of Afghanistan near Gulran.

121. *I. orchoides*, Carrière in *Rev. Hort.*, 1880, 337, fig. 68; Baker in *Bot. Mag.*, 1890, t. 7111; Foster in *Bulbous Irises*, pp. 36, 78, figs. 22, 53 (see accompanying plate). This I find a most satisfactory Juno, growing, increasing, and flowering well, both on bed and border. Its yellow flowers too are very ornamental. The bulb is ovoid, 1 to $1\frac{1}{2}$ in. in diam., coats brown and membranous. The leaves are about six, lanceolate-acuminate, 6 to 9 in. long at flowering time, the border not horny or much less so than in *I. caucasica*. The stem is three to six headed, 1 to 2 ft. high, with distinct internodes; spathes clasping the tube, 2 in. long, one-flowered, the valves green lanceolate. The flowers are 2 to 3 in. across, of rich yellow, usually free from greenish tinge, but with bright orange ridge on the blade of falls, which has also a few variable spots, blotches, or lines of dull violet. They are stalked; the tube is $1\frac{1}{2}$ to 2 in. long; falls with an obovate blade, the claws without the wings so marked in *I. caucasica*; standards oblanceolate, under an inch long, deflexed; style branches an inch long, crests deltoid. Flowers in March or April.

Var. *caerulea*, Regel, *Descr. Pl. Nov.*, ix. p. 37; colour, pale blue or lavender, but with the ridge of falls,



IRIS ORCHIOIDES

and surrounding area yellow with lavender blotches, or the entire blade creamy yellow. The horny margin of the leaf is more conspicuous than in the type. The varieties *linifolia* and *oculata* are described in the work just quoted, but neither, I think, are likely to be under cultivation in Britain. In the Kew Handlist of Herbaceous Plants there is a variety *splendens*. Hybrids have been raised in the Cambridge Botanic Garden between this species and *I. caucasica*. The type and varieties are native of Western Turkestan and in Bokhara.

122. *I. Warleyensis*, Foster in *Gard. Chron.*, June 14, 1902, p. 386, fig. 134. This is a beautiful addition to the garden, introduced by Messrs Van Tubergen of Haarlem in 1901. In bulb, habit, stem, leaves, and inflorescence, this plant closely resembles *I. orchoides*, var. *caerulea*. The horny margin of the leaf is equally conspicuous, and it thus differs from both typical *orchoides* and *bucharica*. From all these it differs markedly in the coloration of the flower. The falls have a pale violet strap-shaped claw, with wavy edge, and somewhat suddenly it expands into a nearly orbicular blade which bears a crenate crest, bright orange in front, deep violet or purple behind, and continuing down the claw as a low white median ridge. About the crest is a zone of deep orange, while the rest of the blade, except for a narrow white margin, is of rich deep violet; coloration, however, is said to vary and the white margin may be inconspicuous or wholly absent. The orange zone about the crest may again be narrow or absent. The standards are small, horizontal, mucronate, and violet in colour. The style-arms are violet on the upper surface, paler below; crests long, violet in colour with wavy margin. Is native of Eastern Bokhara on mountain slopes at an elevation of 5000 to 6000 ft., being gathered on the sides of the river Sureh-ab, a tributary of the Amu Darya.

123. *I. bucharica*, Foster in *Gard. Chron.*, June 14, 1902, p. 385, fig. 135, p. 387; *Bot. Mag.*, 1903, t. 7914. This, like the last, is a beautiful new species and was introduced at the same time by Messrs Van Tubergen of Haarlem. It is nearly allied to *I. orchoides* and similar to it, but as yet cultivated is apparently smaller, shorter, and more slender. The bulb is similar but more globose. The stem is 1 to 1½ ft. high; leaves six or seven, sheathing the stem by their bases, shorter and less gradually pointed than in *I. orchoides*, more distinctly striated on the under surface. The flowers are sessile or nearly so, not stalked as in *I. orchoides*; the tube is about three times as long as the trigonal thin-walled ovary; falls consisting of a strap-shaped claw, pure white in colour, which after a slight constriction expands into a much broader, obovate, emarginate, rich, golden-yellow blade, its hinder two-thirds bearing a large plicate crest, which continues along the claw as an inconspicuous ridge. Spreading from the crest or parallel with it are a few dark purple, almost black marks, but these are said to vary. The standards are small, pure white, spreading horizontally; the claw canaliculate, expanding into a broader, flat, distinctly mucronate blade. The style-arms are large, pure white; the crests large, white, quadrate, or deltoid. Is native of Eastern Bokhara, on mountain slopes at an altitude of 5000 to 6000 ft. on sides of River Sureh-ab, a tributary of the Amu Darya.

This species probably varies, and in the *Bot. Mag.* form the standards are three-lobed, the lateral lobes rounded, the central one acuminate.

124. *I. sindjarensis*, Boisi. et Haussk., *Fl. Orient.* v. 123; Baker in *Bot. Mag.*, 1890, t. 7145. This plant is uncommon but highly desirable; the flowers in effect are pale blue and have a delightful vanilla fragrance. The bulb is very large, elongate, or oblong with fleshy roots. The stem is usually about 1 ft. high but is



IRIS WARLEYENSIS

variable; it bears eight to ten long distichous leaves which narrow very gradually to a sharp point; they are glossy green on the upper surface, very striated below, and their bases so clasp the stem that it is completely hidden. The spathes are 2 in. long, the valves lanceolate, pale green. Three or four flowers are produced which measure 2 to 4 in. across; the tube is 3 in. long; falls oblong-cuneate, the claw winged, blade somewhat narrow, bluish white with blue veins and an inconspicuous yellow median ridge. The standards are oblong, deflexed, 1 in. long; style branches over 1 in. long, like the standards of light blue colour; crests large and deltoid. The whole flower is blue in the centre, becoming paler towards the periphery. Is native of Mesopotamia, near the mountains Sindjar and Taktak, in this country flowering in March. Cultivation does not appear to be difficult; the plant is perfectly hardy, but after a mild winter, which would encourage growth, it may easily be damaged in a cold spring.

Var. *assyriaca*; *I. assyriaca*, Hort. I have seen neither plant nor description, but Sir Michael Foster kindly informs me that it is only a variety of *I. sindjarensis*. The flowers are white, but otherwise similar to those of the type. Mr J. N. Gerard says of it that it is more vigorous than any other Juno, making very large bulbs, 3 in. in diameter. Herr Max Leichtlin, who distributed plants, advised that it should have special treatment, but it has been found to do well in the open. In the *Revue Horticole* it is said to be a native of the Euphrates Valley. I find it offered in several Catalogues, and no doubt it is a desirable plant.

I. sindjarensis × *I. persica*—This hybrid was raised by C. G. Van Tubergen, jun., and is briefly described by Sir Michael Foster in *Gard. Chron.*, April 15, 1899, p. 226. It is a charming plant, quite dwarf, and exceedingly floriferous—a close-growing mass of blue

flowers. The foliage is intermediate between that of the parents. The flower is of fuller colour than in the female parent, but is without the conspicuous colour patch at the apex of the fall, which forms so conspicuous a feature in *I. persica*, the male parent. It flowers about the end of March.

II. Dwarf Junos.

Flowers, yellow; crests quadrate
and large

125. *I. CAUCASICA*

Flowers, pale greenish yellow,
with prominent hairy ridge
on blade of falls; standards
cleft into three lobes at
the tip

126. *I. TUBERGENIANA*

Flowers, lavender, with blotches
of white and marks of
deeper lavender on falls;
crests triangular and small

127. *I. WILLMOTTIANA*

125. *I. caucasica*, Hoffm., *Comm. Soc. Physic. Med. Mosc.*, i. 40; Sweet, *Brit. Fl. Gard.*, t. 255. This is not so ornamental as to deserve general cultivation. It has been confused with the much finer *I. orchoides*, but it differs in being dwarf, in having inflated spathe-valves and sessile flowers, and in possessing a leaf with distinctly horny margin. The bulb is ovoid with brown membranous tunics and fleshy roots; stem short, 3 to 6 headed; spathes $1\frac{1}{2}$ to 2 in. long; valves lanceolate. The flowers are 2 to 3 in. across; tube rather longer than the inflated spathe-valves; falls with a small ovate blade, the claw bearing toothed median ridge, which is higher on the back of blade and having large transparent auricles which embrace the style; standards minute,



IRIS SINDJARENSIS



oblanceolate, toothed and spreading horizontally; style-branches an inch long, the crests large quadrate. All parts of the flower are dull greenish yellow colour except the median ridge of fall and immediate neighbourhood, which is of brighter yellow and more or less marked with violet spots. The flowers are not fragrant. A native of the Caucasus to Asia Minor, Persia, Kurdistan and Turkestan, ascending to 6000 ft.

Sir Michael Foster in "Bulbous Irises" describes a var. *major* (*turkestanica*), which is larger in all its parts, the flowers 4 to 5 on a distinct stem, which is wholly hidden by the clasping bases of the leaves; and a var. *Kbarput*, which differs both from the type and from the var. *major*, and has a stem a foot high. The colour is greenish yellow except the median orange ridge of fall. The claw of fall has hardly any wings, and the blade is large and oval. It is a handsome plant.

126. *I. Tubergeniana*, Foster in *Gard. Chron.*, April 15, 1899, p. 225. An ally of *I. orchioides* and *I. caucasica*, having the foliage habit and general features of the latter, but differing in the colour of the flower, which is the same as in *I. orchioides*. The flower is somewhat similar to that of *I. orchioides*, but differs in the claw of the falls, which bears conspicuous lateral expansions; it is unlike also in the median crest, which is cut up into a conspicuous linear beard. The bulb is somewhat slender; stem about 4 in. high at flowering time, with one to two or more flowers apparently sessile; leaves about six, each $2\frac{1}{2}$ to 3 in. long, by $\frac{1}{2}$ to 2 in. at the broadest part, of light glaucous green, pointed and conspicuously striated, with horny margin; spathe-valves $1\frac{1}{2}$ to 2 in. long, narrow pointed, not inflated, thin but green-membranous at the tip only. The falls are about $1\frac{1}{2}$ in. long, by not quite $\frac{1}{2}$ in. at broadest part, the whole more or less fiddle-shaped; crest forming a linear beard. The standards are minute, three-toothed, the

median tooth usually the longest, spreading horizontally. The style-arms are rather more than an inch long, by not quite half an inch in breadth; the stigma is conspicuous and tongue-shaped; crests large and deltoid. The plant is pleasing, though not exceedingly handsome; it flowers at the same time as *I. reticulata*, forming an agreeable contrast. It was introduced by the firm of C. G. Van Tubergen, jun., but native country is not recorded. Cultivation may be regarded as that of its allies.

127. *I. Willmottiana*, Foster in *Gard. Chron.*, April 27, 1901, p. 261, fig. 100, p. 271; Group illust. *Garden*, June 8, 1901, p. 411. A charming Iris, distinctly new for garden purposes, and deserving specific rank. Its habit is that of *I. caucasica*, and it agrees also in the size, shape, arrangement, and horny margin of the leaf, but the surface is perhaps more glistening and without the glaucous sheen of that species. The flowers, four to six to the stem, agree also in being sessile, but in colour they are quite different, being lavender or some similar tint of purple, with blotches of white mingled with marks of deeper lavender on the fall. The general form of the flower is that of *I. caucasica*, but it is rather smaller, and the lateral expansions of the claw of the fall are less marked and not transparent, thus in some respects approaching *I. orchoides*. The spathe-valves again are narrow, as in *I. orchoides*, and not inflated. The crests are triangular and small, as in *orchoides*, not large and quadrate, as in *I. caucasica*. It is in fact intermediate between these two species. Is native on the mountains of Eastern Turkestan, whence it was introduced by Messrs C. G. Van Tubergen, being named after the well-known patroness and practitioner of horticulture. Cultivation is no doubt the same as for its allies.



IRIS WILLMOTTIANA

III. Stemless Junos.

- *Leaves absent or very short at flowering time in spring.
- †Haft of falls without upturned wings.
- Flowers, yellow; leaves, tetragonous . . . 128. *I. DANFORDIAE*
- Flowers, red-purple or variegated in that colour, and gold and white . 129. *I. ROSENBACHIANA*
- ††Haft of falls with upturned wings or auricles.
- Falls, very pale bluish green, with deep purple blotch on blade (type) or reddish purple, some orange . . . 130. *I. PERSICA*
- Falls, deep blue or reddish purple, with intense purple blades, conspicuous orange median ridge, scented . 131. *I. TAURI*
- Falls, deep blue-purple towards the tip, lighter below, with very little or without orange, not scented . . . 132. *I. STENOPHYLLA*
- Flowers, silver - grey marked with red . 133. *I. SIEHEANA*
- Flowers, clear yellow, or with bright violet blotch on falls . . . 134. *I. BOLLEANA*
- **Leaves 6 to 9 in. long at flowering time in winter.
- Flowers, bright lilac . 135. *I. ALATA*
- Flowers, greenish-yellow 136. *I. PALESTINA*

128. *I. Danfordiae*, Boiss, *Fl. Orient*, v. 124; Hook, fil. in *Bot. Mag.*, t. 7140; Baker in *Gard. Chron.*, Mar. 17, 1900, p. 170, fig. 54; Foster in *Bulbous Irises*, p. 62. *I. Bornmulleri*, Haussk. *I. amasiana*, Born. A very pretty Iris and not, in my experience, very difficult to grow. Sir Michael Foster points out that in all respects, save the minute standards, this Iris belongs to the *reticulata* group, in that particular alone agreeing with the Juno group. This is undoubtedly correct, but I follow Baker in placing it here, because of the facility afforded by that plain character in identification by the plan of classification I have adopted. The bulb is small and oblong with netted coat; the leaves four-sided, hollow, tetragonous, with a horny point produced after the flowers, finally a foot long; spathe-valves lanceolate, subscariose; the flowers are 1 to 2 in. across with tube $1\frac{1}{2}$ in. long, funnel-shaped, of rich yellow colour, with variable dark-brown dots on the blade of fall near the ridge and along the claw; the claw of fall is narrow, suddenly expanding into an ovate blade, which has a conspicuous orange ridge, continued along the claw; the standard is reduced to a mere bristle; the style-branches are $\frac{3}{4}$ in. long; the crests large and ovate. Is native of Asia Minor, the Cilician Taurus, Amasia and Egin. Flowers in February, but sometimes earlier or later.

Herr Max Leichtlin, who introduced the plant, writing in the *Gardeners' Chronicle* of Mar. 7, 1891, p. 306, distinguished between *I. Danfordiae* and *I. Bornmulleri*, pointing out, among other differences, that the "stigma" of the latter has two broad stripes of bright green along the ridge, while in the former it is unmarked. Mr Baker and Sir Michael Foster agree in regarding them as the same.

129. *I. Rosenbachiana*, Regel, *Descr.*, ix. 35; *Garden*, 1888, June 16, tab. 653, fig. 2; Baker in *Bot. Mag.*, t. 7135; Foster in *Gard. Chron.*, 1887, i. p. 90,

and 1889, i. p. 530, also in *Bulbous Irises*, p. 81, figs. 25 and 55. This is a very beautiful and distinct Iris, one of the most gaily painted in all the genus. It is exceedingly variable in colour and being easily raised from seed the cultivator is afforded the pleasure of raising an almost unlimited number of garden varieties. The flowers are usually variegated in purples, yellow and white, the purple being red-purple passing into crimson, or blue-purple passing into dull or dingy lavender; while a more rare form is described by Sir Michael Foster as nearly pure yellow with a few purple or violet markings; and again another beautiful one is of pure white, except for a large patch of deep violet on the blade of the fall and some few veins. All these and other combinations of crimson, gold and white produce a most effective display when the flowers appear on the bare ground with but little sign of foliage, which develops after the flowers. The bulb is ovoid, $\frac{3}{4}$ to 1 in. diam., with thick root-fibres and brown membranous coats; leaves four to five, lanceolate, without horny border, finally 6 to 8 in. long by 2 in. breadth; stem very short, one to three headed; spathes one-flowered; valves lanceolate, green, 2 to 3 in. long. The flowers are 4 in. or more across, with tube 1 to 6 in. long; falls almost strap-shaped, with an oblong blade $\frac{1}{2}$ in. broad, sometimes even narrower than the claw, with a conspicuous median toothed ridge usually orange in colour; standards obovate, an inch long, much channelled; style branches 1 to $1\frac{1}{2}$ in. long; the crests large and quadrate. A native of Bokhara and Turkestan at an elevation of 6000 to 9000 ft. It is perfectly hardy, easily cultivated and flowers in March. One of the most desirable of all spring flowers.

130. *I. persica*, Linn.; *Bot. Mag.*, t. 1; *Red. Lil.*, t. 189; *Garden*, 1888, June 16, t. 653; Foster, *Bulbous Irises*, p. 74, and others, figs. 20, 21, 50. "Persian Iris."

An old introduction, but, in its typical form especially, one of the most charming. It is sweetly scented. The bulb is ovoid, from $\frac{1}{2}$ in. diam. to nearly as large as a hen's egg, with large fleshy roots, the coats brown and membranous. The leaves are four to five to a tuft, linear to much broader, always pointed, more or less arched and bent laterally. The stem is very short, one-headed, the spathe one-flowered, 2 in. long; valves green, lanceolate. The flowers are sessile, 2 to 3 in. across, appearing soon after the leaves begin to shoot; tube 2 to 3 in. long, but variable; falls with a short round blade $\frac{1}{2}$ in. broad, narrower than the claw, which is abruptly expanded into triangular wings or auricles; standards $\frac{1}{2}$ in. long, lanceolate, with toothed or crenate edge, spreading horizontally; crests large, conspicuous, quadrate, with crenate or toothed edge. The colour is variable, usually pale bluish green, a sort of sea-green, with a very deep violet patch on the blade of fall and numerous dark spots on and around the ridge. It flowers in February and March, and is native of Asia Minor and Persia.

Var. purpurea. This was distributed by Herr Max Leichtlin. It is almost wholly of dark red-purple with an orange ridge on the fall and a deeper tint on its blade.

Var. azurea. Under this name Messrs Ware exhibited a plant at the Drill Hall in 1899 which was described in *The Garden* as bold and distinct and quite unique in colour and exquisite marking. I do not find it in recent catalogues, and am unable to refer to good description.

Var. mardinensis. This is offered by dealers, and is described as having flowers of silver grey with purple spots, three weeks earlier than *I. persica*. The falls of a specimen I have show deep purple tips with pale margin but no spots in addition. A native of Mesopotamia.

131. *I. Tauri*, Siehe; G. B. Mallet in *Gard. Chron.*,

1901, Mar. 23, p. 190, fig. 74, also p. 313; *Bot. Mag.*, 1901, t. 7793. This is quite one of the best of recent introduction, and a valuable plant. The bulbs are ovoid, $1\frac{1}{2}$ in. long, three-flowered, with long and stout roots, the coats pale brown; leaves six to seven, in this country very short at flowering time, at length 4 to 6 in. long, $\frac{1}{2}$ to $\frac{1}{2}$ in. wide at base, tapering to an obtuse point, bright green with scabrous margins. The flowers are produced in succession and measure $3\frac{1}{2}$ in. across; the tube is 4 in. long, violet; falls $1\frac{1}{2}$ in. long, obovate-spathulate, with broad ascending wings or auricles, reflexed beyond the middle; blade of intense black-purple with streaks of white; the median ridge of orange colour, bordered with white (in figure of *Bot. Mag.*), not flat as in *stenophylla* but contracted in the middle; standards an inch long, spreading and reflexed, with upturned sides, undulate, violet; style arms enclosed by the wings of falls, violet; crests large, serrated, of richer colour, sometimes bordered with white. The flowers last three weeks in good condition and are produced in the open about the end of February. It is native of the Eastern Taurus, in alpine pastures at an elevation of 6500 ft., also in the upper wooded regions in forests of *Juniperus excelsa* at a height of 4550 ft., where it blooms on the melting of the snow. It was discovered by Mr Siehe of the Hortus Orientalis, Messina. It is quite hardy and cultivation appears not to be difficult. Is valuable in pots.

132. *I. stenophylla*, Hausskn. MSS. ex Baker in *Gard. Chron.*, 1900, vol. i. p. 170, fig. 55; *Bot. Mag.*, 1900, t. 7734. *I. Heldreichii*, Hort. In the *Botanical Magazine* this plant is rightly described as singularly beautiful, and it is one of the most desirable among the more recent introductions. It was first published by Mr Baker in the *Gardener's Chronicle* as above quoted, and like its near ally *I. Tauri*, was discovered by Siehe. The bulb is ovoid, about an inch in diameter, with thick

fleshy roots; the outer coats are dark brown, cleft to the base; the three succeeding are elongated, imbricated, obtuse, and pale in colour, forming a neck 2 in. long, sheathing the bases of the young leaves. The leaves are five to six, at the flowering time rather longer than the perianth-tube, linear, deeply channelled down the face, finally attaining a length of 8 to 10 in., concave, and gradually contracted to an acuminate point. The spathe is bright green, nearly as long as the perianth-tube, which is $2\frac{1}{2}$ in. long, and pale lilac. The falls are stoutly stalked, with the stalk $2\frac{1}{2}$ in. long; the blade broadly ovate-oblong, its base broadly cordate, very deep on the rounded tip, with large purple spots on a white or pale lilac ground. The standards are scarcely an inch long, spreading and reflexed, of pale lilac colour. The style arms are pale lilac with very large, nearly round crests, reaching almost to the length of falls. It is native of the Sicilian Taurus and flowers in February. Apparently it is not difficult of cultivation, and may be grown in pots for the greenhouse.

133. *I. Sieheana, mibi*; *I. Haussknechti*, Siehe in *Gard. Chron.*, 1901, May 18, p. 313; *I. persica magna*, Hort. According to Siehe this plant has nothing to do with *I. persica*, and his view may no doubt be accepted to the extent that it is at least as distinct as other allied forms to which specific names have been given. The name *Haussknechti* cannot stand, because it has already been applied by Bornmuller to an Iris of the Apogon group (see *Baker's Handbook*, p. 4), and therefore I venture to name it in honour of the discoverer of some of the most beautiful members of this group. I am unable to give a complete description, but the plant is characterised by leaves nearly as broad as those of *I. persica*, which roll themselves together and appear to be bent in every direction, a white membranous margin being conspicuous; the flowers large, of silver grey colour marked

with red. A specimen in my possession appears to show alliance with *I. persica purpurea*, but that the wings of the falls are much more obtuse, the lip less round and the standards distinctly smaller. It grows in the undergrowth of forests of *Pinus Bruttia* in the Taurus mountains.

134. *I. Bolleana*, Siehe in *Gard. Chron.*, 1901, May 18, p. 313. My only acquaintance with this Iris is from the general description above quoted, and from the still shorter remarks in novelty lists. Apparently it must be a desirable kind and distinct. The leaves are very narrow with white membranous margins, limp when young and curled about in every direction. The flower is either clear yellow in colour or with a bright violet blotch on each fall in addition. The yellow colour makes it distinct in the *persica* group. It is found on low limestone hills near the sea, at a height of from 650 to 950 feet on the Cilian Taurus. We have still to wait on experience for knowledge of culture.

135. *I. alata*, Poir. *Bot. Reg.*, t. 1876; *Bot. Mag.*, t. 6352; Foster in *Bulbous Irises*, p. 82, and others, figs. 28, 57; *Garden*, 1898, Aug. 6, p. 102 (illust.). *I. scorpioides*, Deof. *Red. Lil.*, t. 211. "Scorpion Iris." A very charming and well-known Iris, not commonly grown, because of difficulties proceeding from the winter season of its growth. The bulb is ovoid, $1\frac{1}{2}$ to 2 in. diam., with thick finger-like root and several brown membranous coats. The leaves are about six, distichous, clasping and hiding the short stem, lanceolate, acuminate, bent into a channel, arched and pale green, up to a foot in length; spathe-valves lanceolate, more or less withered at flowering time. The flower is large and sessile, usually one; the tube 3 to 6 in. long; limb bright lilac, 3 to 4 in. long; falls obovate-cuneate, with a blade 1 to $1\frac{1}{2}$ in. broad, shorter than the haft, and a yellow keel; the claw with triangular wings, which embrace

the style; standards very small, lanceolate-spathulate, an inch long; style arms $1\frac{1}{2}$ to 2 in. long, with large subquadrate crests; capsule oblong, buried among the leaves; seeds oval. A native of Portugal and Spain to Sicily, Algiers, Morocco, Sardinia and Greece. A white variety is found in Spain and in the Atlas mountains. There is a variety, presumably of coppery colour, called *cupreata*, the origin of which is not known. Others are *speciosa* and *lilacina* from the Atlas mountains, *nigrescens*, *cinerea*, and *magna* from Sicily, but none of these appear in English catalogues. Messrs Barr & Son offer a variety under the name *atro-caerulea*, with flowers of deep blue. At Kew a white variety is cultivated. In pots the plants may flower with leaves only 2 in. long.

In favoured localities of the southern counties this species may flourish, especially if suitably cared for, but it grows and flowers in winter, so that elsewhere it is practically impossible to make it flourish permanently. Well ripened bulbs are easily flowered in pots. They should be potted in summer or early autumn, and plunged in ashes until frost threatens, when they must be transferred to a shelf in the greenhouse. I once planted it on rockery under a light, at foot of a south wall, and flowers were produced, the plants living, I think, for about three years. The bulbs are not expensive. The earlier may flower in October, the later in January.

136. *I. palaestina*, Boiss., *Fl. Orient*, v. 122; Foster in *Bulbous Irises*, p. 38, fig. 23; p. 79, fig. 54. I have little reason for including this species; it is difficult of cultivation, and hardly worth trouble, but, being found on Mount Hebron, Mount Carmel, and in the Valley of the Jordan, it is as likely, perhaps, to be brought here by travellers as *I. Vartani*, which sometimes comes to hand. The bulb is ovoid, 1 to $1\frac{1}{2}$ in. diam.; the coats brown and membranous; stem very short, hidden among

the leaves, which number about six; they are lanceolate-acuminate, falcate, 3 to 6 in. long at flowering time, with a finely toothed horny margin. The spathe-valves are green and lanceolate. The flowers are from one to three, $1\frac{1}{2}$ to 2 in. across, like those of *I. caucasica*, but with a tube 2 to 3 in. long; falls with orbicular blade $\frac{1}{2}$ in. broad; the haft auricled at the top; standards minute spreading, oblanceolate, toothed; style branches $1\frac{1}{2}$ in. long; crests large, rectangular. The colour of the flower is usually greenish yellow, the blade of the fall being marked with green or with a variable amount of blue or violet. There is a variety named **caerulea**, with flowers fairly blue. The median ridge of the fall, orange in front, has behind a number of black or deep violet tubercles, each carrying a tuft of hairs. The flowers are fragrant produced in January or February. Must have the pot culture of *I. alata*.

CHAPTER XVI

Gynandiris.

(Bulbous Irises with stamens adhering to style branches.)

- One species only 137. I. SISYRINCHIUM
Flowers, much spotted; anthers
for the most part free var. MARICOIDES
Flowers, small and dull coloured,
one leaf only var. MONOPHYLLA
Flowers, exceedingly small, leaf
attaining 3 ft. or more in
length var. SICULA

137. I. *Sisyrinchium*, L.; *Red. Lil.*, 29; Foster in *Bulbous Irises*, figs. 1, 2 and 32, pp. 2, 3 and 55; *Moraea Sisyrinchium*, Ker, in *Bot. Mag.*, t. 1407; *M. Tenoreana*, Sweet, *Brit. Fl. Gard.*, t. 110; *Xiphion Sisyrinchium*, Baker, in *Bot. Mag.*, t. 6096 (see accompanying plate). The "Spanish nut" and the "Barbary nut" of Parkinson.

Sir Michael Foster regards this as probably one of the oldest Irises in existence, retaining the archaic features of the stock from which many other Irises have descended, and in this respect it is therefore one of the most interesting of all. It is exceedingly variable, and usually difficult to keep, but some bulbs I collected on a hill above Genoa have formed a clump which, after ten years, continues in perfect vigour. While some forms are not worth growing, mine is exceedingly charming. The variations are from light blue to reddish purple, with variable spots and veins on the blade of fall, which usually has a



IRIS SISYRINCHIUM

“signal patch” of white. The bulb is edible. It is small and globose, the outer coats entirely fibrous. The stem is from 2 in. to a foot or more in length with one to three heads, the lateral sessile. The leaves are usually two, borne on the stem, linear, arched, $\frac{1}{2}$ to 1 ft. long and strongly veined; spathe two to three flowered, 2 to 2 $\frac{1}{2}$ in. long; the outer valves subscariose at flowering time; pedicels very short. The flowers may be very small or with limb 1 to 1 $\frac{1}{2}$ in. long; the tube is slender, usually an inch long; falls with oblong blade, $\frac{1}{2}$ in. broad, as long as the haft, “with a faint yellow spot bordered with white in the centre”; standards rather shorter, oblanceolate, $\frac{1}{4}$ to $\frac{1}{2}$ in. broad; style-branches under an inch long, crests large, lanceolate-deltoid. The flowers are often fragrant, but unfortunately last less than a day and require sunshine to make any display.

The variety **maricoides** (*I. maricoides*, Regel, *Descr.*, iv. 36) is from the high mountains of Bokhara, 10,000 to 12,000 ft., and is one of the most distinct. The filaments are said to be free from the style and from one another. The variety **monophylla** (*Gynandiris monophylla*, Klatt) is dwarf with a single leaf and single head of flowers. The variety **sicula** (*Moraea sicula*, Tod.) has exceedingly small flowers and remarkable leaves 3 to 4 ft. long. It was grown for several years in the Cambridge Botanic Garden.

For cultivation try the hottest, sunniest spot at the foot of a south wall. In the Cambridge Botanic Garden it has succeeded without overhead protection.

It is recorded that this species is largely used for fodder in Baltistan, Kashmir.

CHAPTER XVII

Hermodactylus.

(The Iris with tuberous root.)

138. *I. tuberosa*, Linn. *Bot. Mag.*, t. 531; *Red. Lil.*, t. 48; *Eng. Bot.*, 3rd ed., t. 1496; Foster, *Bulbous Irises*, figs. 19 and 49; *Hermodactylus tuberosus*, Salisb. (see plate). This interesting plant with green and black flowers is altogether an Iris from a garden point of view, though often separated by botanists on account of its one-celled ovary and fingered rootstock. It is sometimes known as the "Snake's-head" or "Widow Iris," and although sombre in colour is considered to have so much beauty that it can be spoken of as lovely and charming. The rootstock is a *tuber*, either unbranched or with three or more finger-like branches when fully grown. The leaves are 1 to 2 ft. long, four-sided, with a horny point like those of *I. reticulata*, and of this formation there is no other Iris outside the *reticulata* group. The stem is one-headed, a foot or more long; the spathe, one-flowered, with usually one large lanceolate valve (two in the variety *bispathacea*); pedicel 1 to 2 in. long. The flower is funnel-shaped, about 2 in. across; falls with a much rounded reflexing, black brown blade, $\frac{1}{2}$ in. or $\frac{5}{8}$ in. across, its haft rather broader, tapering to the base; standards, very small and narrow, tapering to a cusp or awn. In a specimen before me the upper part of the standards is of hair-like fineness. The crests are deltoid or lanceolate, notched on the outer edge. The capsule is obovate, swollen. Except for the black-brown of the blade, the flowers are green.



IRIS TUBEROSA

There is a variety **longifolia** from Naples with very long leaves, a variety **repens** with short leaves and a single spathe-valve and the variety **bispathacea** which is the form figured in the *Botanical Magazine*, and perhaps the one most usually cultivated. Is native of the Mediterranean region, from Southern France to Turkey and Greece, and in North Africa. It is naturalised in some parts of Devon and Cornwall.

It grows and flowers well in the ordinary soil of the Cambridge Botanic Garden, and will grow well no doubt in any light and fairly dry soil.

CHAPTER XVIII

Nepalenses.

(Irises with a bristly winter bud—neither rhizomatous nor bulbous.)

Perianth-tube $1\frac{1}{2}$ in. long	.	I. NEPALENSIS.
Perianth-tube very short	.	I. COLLETTII.

139. *I. nepalensis*, Don.; Sweet, *Brit. Fl. Gard.*, 2nd ser., t. 11; Foster in *Bulbous Irises*, figs. 29, 30, 31, 58; pp. 49, 50, 51, 84; *I. decora*, Wall. This must not be confounded with the *Iris nepalensis* of Wallich, which is figured in the *Botanical Register*, t. 818, and is merely a variety of *I. germanica*, or, as Mr Baker makes it, the *I. deflexa* of Knowles and West. In its resting condition this plant consists in a bud, covered entirely by the fibrous remains of the old leaves, and from which proceed a number of fleshy roots, much like those of a Juno Iris but more numerous, throng-like, and more uniform in size. The blade of the fall spreads horizontally and bears a median ridge which extends along the claw and is fringed or even cut up into irregular hairs. On account of that feature Mr Baker places this species in *Evansia*, but it is merely a parallelism, of which there are many in the genus *Iris*, that does not afford any evidence of relationship. As the plant is not in cultivation, is not very ornamental, and is rather difficult to grow, I may refrain from further description. It is worth mention as the type of this section, which has descended probably

from the same ancestors as the Juno Irises, but on another line of development. It is native of the mountains of Nepaul, and would be interesting to re-introduce. Moisture is necessary in summer but dryness in winter, which may be attained by covering with lights.

140. *I. Collettii*, Hook. fil. *Bot. Mag.*, 1903, t. 7889; *I. nepalensis*, D. Don *forma depauperata*, Collet and Hemsl. in *Jour. Linn. Soc.*, vol. xxviii. (1890) p. 136; *I. nepalensis*, D. Don., var. *Letha*, Fost. in *Gard. Chron.*, 1892, vol. ii. p. 458. This is the synonymy taken up for *I. Collettii* in the *Botanical Magazine*, but whereas Sir Michael Foster describes his *nepalensis*, var. *Letha*, as having flowers which nestle among the bases of the young leaves, *I. Collettii* is figured with stems of some length. The *Botanical Magazine* plant and Sir Michael Foster's plant were obtained by different collectors, and the thought arises whether from a garden point of view they are identical. While Kew plants died in the open border, those in Sir Michael Foster's garden, ripened by covering with a light in late autumn, came through the winter with loose mulching; and though the ripening may have enabled the plants to survive, the results are in accordance with the difference of elevation at which the respective stocks were said to have been collected. The figure of *I. Collettii* represents a charming plant. The roots are crowded, a quarter of an inch in diameter, and of equal thickness, not tapering as in *I. nepalensis*. The leaves are narrowly ensiform, strongly nerved, dark green; the bases surrounded by rigid brown fibres. The stems are about 6 in. high, one or two flowered; spathes $1\frac{1}{2}$ to 2 in. long, narrow, acuminate, and green in colour. The perianth-tube is short, the limb $1\frac{1}{2}$ in. diameter, of nearly equal segments, which are spreading, revolute, violet blue streaked with white towards the base, the crest of the falls being orange yellow, and not

bearded as in *I. nepalensis*. The crests of the stigmas are large, erect, dimidiate-ovate, acute, and quite entire. The specimen figured was grown in a greenhouse, and the flowers were slightly fragrant. Is native of Burma in the Shan hills.

Omitted from Classification.

In the last edition of the Kew Handlist of Herbaceous Plants I find the following, but too late to include them in their proper position.

Pogoniris—Biflorae.

I. mandschurica, Maxim. in *Bull. Acad. Peters.*, x. 724. This is an ally of *I. flavissima*. The rhizome is short, creeping, and the sheaths of the leaves do not split up into fibres. The leaves are ensiform, green, 6 in. long and $\frac{1}{2}$ in. broad. The stem is very short, one-headed; spathe two-flowered, $1\frac{1}{2}$ in. long; valves lanceolate green with a scariose edge; pedicel short. The perianth-tube is $\frac{1}{2}$ in. long; limb yellow; falls obovate-cuneate, truncate, $1\frac{1}{2}$ to 2 in. long, $\frac{1}{2}$ in. broad; the beard yellow; standards shorter and rather narrower. The style branches are above an inch long, crests obtuse, dentate. A native of Southern Manchuria, flowering late in May.

Juno.

I. Aitchisoni, Baker, *Garden*, 1898, Aug. 6, plate 1182. This, Mr Baker says, has the habit and leaves of *I. Xiphium*, but standards small and spreading. Sir Michael Foster observes, in his *Bulbous Irises*, that by its tall stem, its leaves, and the absence of wings to the claw of the fall, it draws near to the *Xiphium* group, but the fleshy roots and small spreading standards mark it as a *Juno*. The bulb is ovoid, 1 to $1\frac{1}{2}$ in. diameter, with fleshy root fibres and brown mem-

branous tunics. The leaves are linear-subterete, 1 to $1\frac{1}{2}$ ft. long at flowering time; stem $\frac{1}{2}$ to 1 ft. long, one to three headed; spathes one-flowered, 2 to $2\frac{1}{2}$ in. long; valves green, lanceolate. The perianth-tube is 1 to $1\frac{1}{2}$ in. long; limb $1\frac{1}{2}$ to 2 in. long, bright lilac in the type; falls with an obovate blade $\frac{1}{2}$ in. broad, $\frac{1}{3}$ to $\frac{1}{2}$ the length of haft; standards spreading, tricuspidate, under an inch long; style branches $1\frac{1}{2}$ in. long; crests lanceolate, deltoid. Is difficult to grow.

Var. **chrysantha**, Baker. This has bright yellow flowers, and like the type is cultivated at Kew.

I. **propendens**, Lange in *Bot. Tidsskr.*, 1895, 255. The habitat of this plant is unknown. I have no description in any work to which I could refer at the last moment on going to press.

SPECIES EXCLUDED

Incorrectly called *Iris*, and therefore excluded, are :—

I. pavonia = *Moraea glaucopis*, Baker.

I. Robinsoniana = *Moraea Robinsoniana*, F. Mull.

The so-called *I. pavonia* is a charming plant, and is often included in bulb collections, but it does not come within the scope of this book.

GLOSSARY OF BOTANICAL TERMS

N.B.—Terms descriptive of form are often combined to describe intermediate outline, as ovate-lanceolate.

A

Acuminate (*Acumen*, Lat., a point), tapering gradually to a point.

Acute (*Acutus*, Lat., sharp), sharp-pointed.

Anther (*Antheros*, Gr., flowering), the part of the stamen which contains the pollen, usually bilocular, usually and in Iris supported on a filament or stalk.

Articulate (*Articulos*, Lat., a joint), jointed and freely separating.

Auricle (*Auricula*, Lat., ear-lap), an ear-like appendage.

B

Beak (*Bec*, Celt., akin to peak), a pointed projection, as at the top of certain Iris fruits. Adj., beaked.

Beard (*Barba* in Lat.), a collection of closely set hairs,

characteristic of many Irises on the "falls."

Bifurcate (*Furca*, Lat., a fork), divided into two branches.

Blade (*Blod*, A.S.), the expanded portion of a flat organ.

Bract (*Bractea*, Lat., a thin plate of metal), a reduced leaf on a flower-stem, or below a flower.

Bulb (*Bulbus*, Lat., a bulb), a modified bud, usually underground, the stem very short bearing fleshy scales, as in Onion or Hyacinth.

C

Canaliculate (*Canaliculus*, Lat., a small channel), with a longitudinal groove or channel.

Cell (*Cellula*, Lat., a small apartment), in descriptive botany a small compartment as of the ovary or fruit; of

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the anther, in which there are usually two.

Ciliate (*Ciliatus*, Lat., fringed with hair), lined or margined with hairs.

Clavate (*Clava*, Lat., a club), gradually thickened upwards.

Claw, the stalk or lengthened base of a floral segment.

Complicate (*Complicatus*, *complico*, Lat., I fold together), folded upon itself.

Cordate (*Cordatus*, Lat., heart-shaped), applied to a flat organ with a broad and notched base.

Cotyledon (*Kotyledon*, Gr., a hollow), the seed-leaf.

Crenate (*Crena*, Lat., a notch), with rounded teeth right-angled to the margin.

Crenulate, diminutive of *Crenate*, used when the teeth are comparatively small.

Crest (*Crista*, Lat.), an elevated line, or ridges, on the segment of an Iris flower, characteristic of the section *Evansia*; crests, the appendages of the stigma.

Cross, *see* hybrid.

Cuneate (*Cuneus*, Lat., a wedge), wedge-shaped but applied to flat organs.

Cusp (*Curpis*, Lat., a point), a sharp rigid point. Adj., cuspidate, tipped with a rigid point.

D

Deltoid (*Delta*, the Gr. letter D), triangular in outline.

Dentate (*Dens*, Lat., a tooth), with sharpish teeth right-angled to the margin.

Denticulate, diminutive of dentate.

Distichous (*Distichos*, Gr., of two rows), said of leaves when in opposite vertical ranks on the stem.

E

Ellipsoidal (*Elleipsis*, Gr., a falling short, *eidos*, like), applied to a solid, oblong in longitudinal section, the ends regularly rounded.

Elliptical, applied to a flat surface, like oblong but a degree broader — half way from needle-shaped to quite round.

Emarginate (*Emargino*, Lat., to deprive of its edge), having a small notch at the extremity of a floral segment or leaf.

Endosperm (*Endon*, within, *Sperma*, seed, Gr.), the reserve food outside the embryo of a seed, recently limited to that deposited within the embryo sac.

Ensiform (*Ensis*, Lat., a sword, *Forma*, Lat., shape), sword-

shaped, as the leaves of most Irises when not grass-like.

Equitant (*Equitans*, Lat., riding), as if astride, like the basal portion of the leaves of many Irises.

Erosee (*Erosee*, Lat., gnawed), said of a margin when irregularly toothed, as if bitten.

Exserted (*Exsertus*, Lat., protruded), protruding beyond, as stamens beyond the tube of corolla.

Extrorse (*Exterus*, Lat., on the outside), directed outwards, as the opening of an anther.

F

Falcate (*Falcatus*, Lat., sickle-shaped), curved like a sickle.

"Fall," a special term, applied to the outer and usually more or less reflected segments of the Iris flower.

Filiform (*Filum*, Lat., a thread), thread-shaped.

Fimbriate (*Fimbriae* (pl.), Lat., a fringe), applied to a fringed or finely-cut margin.

Form, *see* species.

Fugacious (*Fugax*, Lat., fleeting), very soon fading.

Fulvous (*Fulvus*, Lat., tawny), of reddish-yellow colour.

G

Genus, *see* species.

Glabrous (*Glaber*, Lat., without hair), destitute of hairs or roughness.

Glaucescent (*Glaukos*, Gr., bluish-grey), slightly covered with surface bloom.

Glaucous, covered with bloom as the young leaf of cabbage.

Globose (*Globosus*, Lat.), nearly spherical.

H

Haft (A.S. *Hæft*), a handle, the stalk or claw of a floral segment.

Hexagonal (*Hex*, Gr., six, *gonia*, Gr., angle), six-angled.

Hybrid, offspring from parents regarded as specifically distinct, cross being the term used for offspring from parents which are different but more closely related. The distinction is not always made.

I

Imbricate (*Imbricatus*, Lat., covered with gutter-tiles), overlapping as the tiles on a roof.

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Internode (*Inter*, Lat., between, *nodus*, Lat., a knot), the portion of stem between any leaf and the one next above or below.

L

Lacinate (*Lacinia*, Lat., the flap of a garment), slashed or cut into narrow lobes.

Lanceolate (*Lanceo*, Lat., a lance), used for a leaf or flat organ when narrow with the base slightly broadened; the next breadth after subulate or awl-shaped.

Ligulate (*Ligula*, Lat., a little tongue), strap-shaped.

Limb (*Limbus*, Lat., a border), the free-expanded portion of a gamopetalous corolla or gamosepalous calyx; of an Iris flower, the "falls" and "standards."

Linear (*Linea*, Lat., a line or thread), narrow, several times longer than wide; of a long narrow leaf.

M

Mucronate (*Mucro*, Lat., a sharp point), with a short and straight point, as at the apex of a leaf.

O

Oblanceolate (*Ob*, as a prefix, usually means inversely or oppositely), inversely lanceolate.

Oblong (*Oblongus*, Lat., rather long), much longer than broad; follows linear in next degree of breadth, less than oval.

Obovate, inversely ovate.

Obtuse (*Obtusus*, Lat., blunt or rounded at the end), with a short rounded point.

Ochraceous (*Ocra*, Lat., a yellow earth), yellow with a tinge of red.

Orbicular (*Orbicularis*, Lat., circular), nearly or quite round.

Oval (*Ovum*, Lat., an egg), a degree broader than oblong and less than elliptical.

Ovate (*Ovatus*, Lat., egg-shaped), shaped like the longitudinal section of a hen's egg; used to express a greater breadth than lanceolate.

Ovary (*Ovum*, Lat., an egg), that part of the pistil which ultimately forms the fruit; the **germen** of old authors.

P

Panduriform (*Pandura*, Lat., a three-stringed musical

instrument), fiddle-shaped, *i.e.* curved in on each side as the leaf of *Rumex pulcher*.

Panicle (*Panicula*, Lat., a tuft), a particular kind of indefinite inflorescence (like that of most grasses), the principal axis bearing lateral axes upon which stalked flowers are borne.

Pedicle (*Pediculus*, Lat., a small foot), an ultimate flower stalk supporting a single flower.

Peduncle (*Pes*, Lat., a foot), the general term for flower-stalk.

Perianth (*Peri*, Gr., around, *Anthos*, Gr., a flower), the floral leaves or envelopes. Used especially for Monocotyledons, in which calyx and corolla are very often similar.

Petaloid (*Petalon*, Gr., a flower leaf, *Eidos*, Gr., like), like a petal, chiefly used for sepals to indicate that they are coloured.

Plicate (*Plica*, Lat., a plait), plaited in folds like a fan, applied to the folding of a leaf; sometimes used for complicate.

Pollen (*Pollen*, Lat., fine flour), the dust-like powder of the anther, consisting of cells which contain the male fertilising element.

Puberulous (*Puberulus*, Lat.,

diminutive of *puber*, downy), slightly covered with fine soft hair.

Pubescent (*Pubes*, Lat., downy), clothed with soft hair or down.

Pubescence (*Pubes*, Lat., downy), soft hairiness.

Q

Quadrat (*Quadra*, Lat., a square), somewhat square in outline.

R

Reticulate (*Reticulatus*, Lat., net-like), netted; like the veins of a leaf, or the outer coats of the bulb of *I. reticulata*.

Revolute (*Revolutus*, Lat., part of *Revolvo*, to roll back), used for leaf-margins, etc., when rolled below the plane of the organ.

Rhizome (*Rhiza*, Gr., a root), a prostrate stem on or below the ground.

Rhomboidal (*Rhombus*, Lat., a figure whose four sides and opposite angles are equal), approaching a rhomb in outline—a four-sided figure having its sides equal but its angles not right angles.

Rootstock, a general term for short stems in or on the

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ground, from which annual growths are made.

Rostrate (*Rostratus*, Lat., having a beak or hooked point), terminating with a beak-like extension.

S

Scape (*Scapus*, Lat., a stem or stalk), a leafless flower-stem or floral axis, rising from the ground.

Scariose or Scarious (*Scaria*, Lat., a thorny shrub), thin, dried up and membranous.

Segment (*Segmentum*, Lat., a piece cut off), one of the divisions of an organ as of the perianth—six in Iris.

Serrate (*Serra*, Lat., a saw), with saw-like teeth, leaning forward.

Serrulate, serrate, with minute teeth.

Sessile (*Sessilis*, Lat., sitting), without a stalk.

"Signal," a special term in Iris, applied to the spot of colour on the falls of many Irises signalling to insects the part of the flower they wish to reach.

Spathe (*Spathe*, Gr., a spatula), a large bract enclosing a flower, or flowers; or several bracts (each of which is then a valve) enclosing a flower or flowers.

Spathe valve, *see* above.

Species (*Species*, Lat., a sort or kind). In classification, species is subordinate to, and included within genus, variety being the next finer degree of discrimination and "form" the ultimate finest degree, thus:—

Iris ("genus," including all Irises).

— pumila ("species," including all below).

— caerulea ("variety," including forms).

— — — — — Count
Andrassy ("form," a slight variation of the variety caerulea).

Spicate (*Spicatus*, Lat., spiked), with the attributes of "spike," which *see*.

Spike (*Spica*, Lat., an ear of corn), an indefinite inflorescence with flowers sessile on a common elongated axis.

Stamen (*Stemon*, Gr., a filament), one of the male organs of a flower consisting of filament and anther.

"Standard," a special term for the inner segments of an Iris flower; are frequently more or less erect, while the "falls" reflex.

Stigma (*Stigma*, Gr., a point), the part of the pistil or style upon which the pollen can be effective.

Stipitate (*Stipes*, Lat., a stock or post), having a special stalk.

Stolon (*Stola*, Lat., a useless sucker), a basal prostrate branch disposed to root, a kind of sucker.

Striate (*Stria*, Lat., a furrow), marked with fine longitudinal parallel lines, as grooves or ridges.

Style (*Stylus*, Lat., a stem or column), the stalk which bears the stigma;—arms, or — branches, the divisions of the style in Iris, each bearing a stigma.

Sub (Lat., under or below), used as a prefix implies an approach to the condition indicated by the rest of the word.

Sword-shaped, the same as ensiform.

T

Terete (*Teres*, Lat., rounded), circular in transverse section.

Tetragon, -al, -ous (*Tetras*, Gr., four, *Gonia*, Gr., an angle), with four obtuse angles in section.

Trigon, -al, -ous, with three obtuse angles in section.

Triquetrous (*Triquetrus*, Lat., three-cornered), with three sharp angles in section.

Truncate (*Truncus*, Lat., a stump), terminating very abruptly.

Tube (*Tubus*, Lat., a pipe), the united lower part of a calyx, corolla, or perianth, usually hollow, but in Iris most frequently solid with the enclosed style.

Tuber (*Tuber*, Lat., a hump), a short, thickened underground stem or tumour, set with buds: Ex. Potato.

Tuberculate (*Tuberculum*, Lat., a small swelling), beset with warts.

Tuberous, assuming the form of a tuber, as the root of a Dahlia.

U

Undulate (*Undulatus*, Lat., wavy), frequently applied to a wavy margin.

Ungiculate (*Unguis*, Lat., a nail of finger or toe), applied to petal or perianth-segment when stalked.

V

Valve (*Valvae* (plu.), Lat., the leaves of a door), of a capsule, each of the portions into which it splits; of a spathe, the bracts of which it is composed.

Variety, *see* Species.

Ventricosæ (*Venter*, Lat., the belly), inflated on one side, bellied.

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